AD-A237 900

DOCUMENTATION PAGE

Form Approved
OMB No. 0704-0188

1b. RESTRICTIVE MARKINGS
N/A

2a. SECURITY CLASSIFICATION AUTHORITY
N/A

3. DISTRIBUTION/AVAILABILITY OF REPORT
UNCLASSIFIED/UNLIMITED

2b. DECLASSIFICATION/DOWNGRADING SCHEDULE
N/A

4. PERFORMING ORGANIZATION REPORT NUMBER(S)
1-87

5. MONITORING ORGANIZATION REPORT NUMBER(S)

6a. NAME OF PERFORMING ORGANIZATION
KIMBROUGH ARMY COMMUNITY HOSPITAL

6b. OFFICE SYMBOL (If applicable)

7a. NAME OF MONITORING ORGANIZATION
U.S. ARMY-BAYLOR UNIVERSITY GRADUATE PROGRAM IN HEALTH CARE ADMIN

6c. ADDRESS (City, State, and ZIP Code)
FT. GEORGE G. MEADE, MD

7b. ADDRESS (City, State, and ZIP Code)
AHS
SAN ANTONIO, TEXAS 78234-6100

8a. NAME OF FUNDING/SPONSORING ORGANIZATION

8b. OFFICE SYMBOL (If applicable)

9. PROCUREMENT INSTRUMENT IDENTIFICATION NUMBER

8c. ADDRESS (City, State, and ZIP Code)

10. SOURCE OF FUNDING NUMBERS

PROGRAM ELEMENT NO.	PROJECT NO.	TASK NO.	WORK UNIT ACCESSION NO.

11. TITLE (Include Security Classification)
A STUDY TO DETERMINE THE FEASIBILITY OF ESTABLISHING A TRI-SERVICE MAIL ORDER PHARMACY SYSTEM

12. PERSONAL AUTHOR(S)
GABBARD, MARY L.

13a. TYPE OF REPORT	13b. TIME COVERED	14. DATE OF REPORT (Year, Month, Day)	15. PAGE COUNT
FINAL	FROM 12/89 TO 12/90	1 DECEMBER 1990	139

16. SUPPLEMENTARY NOTATION

17. COSATI CODES		
FIELD	GROUP	SUB-GROUP

18. SUBJECT TERMS (Continue on reverse if necessary and identify by block number)
MAIL SERVICE PHARMACY; COST COMPONENTS; MEDICAL TREATMENT FACILITY MAIL SERVICE MODE

19. ABSTRACT (Continue on reverse if necessary and identify by block number)

SEE ATTACHED

20. DISTRIBUTION/AVAILABILITY OF ABSTRACT
☒ UNCLASSIFIED/UNLIMITED ☐ SAME AS RPT. ☐ DTIC USERS

21. ABSTRACT SECURITY CLASSIFICATION

22a. NAME OF RESPONSIBLE INDIVIDUAL
MARY L. GABBARD

22b. TELEPHONE (Include Area Code)

22c. OFFICE SYMBOL

DD Form 1473, JUN 86 Previous editions are obsolete. SECURITY CLASSIFICATION OF THIS PAGE

ABSTRACT

Since pressure to contain health care costs is increasing, dispensing pharmaceuticals by mail is becoming an attractive alternative. Mail service pharmacy is a form of pharmacy practice that dispenses medications through the mail and delivery services. Ingredient costs of prescriptions have been increasing at almost twice the rate of the Consumer Price Index over the past decade. The cost of prescription drugs has also increased more than hospitalization or physician fees during this time. In the civilian community many employer-sponsored mail service drug programs have become increasingly popular in recent years. The military has addressed this issue but has not conducted cost-effectiveness studies of possible options. This research examines the feasibility of establishing a Tri-service mail order pharmacy system for out-patient refill maintenance prescription drugs. Four models are assessed to determine the consequences of mail order dispensing on the military prescription refill system. The study identifies the major cost components associated with pharmaceutical delivery of each of these models (ingredient costs, dispensing...

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contracted mail order pharmacy service is the route for the military's future.

PAGES _____

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ORIGINAL

DOCUMENT

HSXR-ZX/(HSHA-IHC/Aug 89) (1) 1st End COL Brothers/ma/AV923-4181
SUBJECT: Graduate Management Project Proposal

HQ, U.S. Army Medical Department Activity, Fort Geo. G. Meade, MD 20755-5800 25 MAY 1990

FOR Residency Committee, U.S. Army-Baylor University Graduate Program in Health Care Administration, Academy of Health Sciences, Fort Sam Houston, TX 78234-6100

The Graduate Management Project for MAJ Mary L. Gabbard is enclosed and is recommended to the Committee for approval.

C. P. BROTHERS
COL, MS
Deputy Commander for Administration

Encl
(2 cys)

A STUDY TO DETERMINE THE FEASIBILITY OF ESTABLISHING A TRI-SERVICE MAIL ORDER PHARMACY SYSTEM

A Graduate Management Project

Submitted to the Faculty of

Baylor University

In Partial Fulfillment of the

Requirements for the Degree

of

Master of Health Administration

by

Major Mary L. Gabbard, AN

1 December 1990

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DEDICATION

To my husband and best friend, William D; to my beautiful son, John Francis Xavier, for their love, encouragement, understanding, support and endurance throughout this past year during the research, development, and preparation of this Graduate Management Project.

My loving thanks.

ACKNOWLEDGMENTS

I would like to extend my sincere appreciation and thanks to the following individuals and organizations who assisted and guided me in the development and preparation of my Graduate Management Project:

To Colonel C.P. Brothers, my mentor and preceptor in the US Army Baylor Graduate Program, and the DCA at Kimbrough Army Community Hospital. His advice, assistance, patience, confidence, encouragement and time were invaluable to the successful completion of this Graduate Management Project.

To Colonel Robert B. McLean (Ret), Commander of Kimbrough Army Community Hospital. His enthusiasm, support and vision in conceptualizing this project idea set the wheels in motion.

To Major David A. Kotzin, Chief, Pharmacy Service at Kimbrough. His direction, insightful suggestions, assistance with data-gathering and his innovations in the Buy Big, Buy Smart arena were critical in helping me formulate the framework of the project.

To Colonel George Gisin, Baylor Program Director, Academy of Health Sciences, Ft Sam Houston, Texas. His

assistance was invaluable in approving the non-disclosure statement. Only his understanding of the confidential nature of certain proprietary information allowed me to conduct essential research.

To Mrs Joyce Corley, librarian at Kimbrough. She provided untiring effort in assisting me in my literature search.

To the remarkable pharmacy staff at Kimbrough, especially SFC Yerkes and Specialist 4th Class Boyd who spent numerous hours of off-duty time in retrieving computerized information for my database.

To the pharmacy staffs at Walter Reed and Dewitt for their assistance in data retrieval.

To Colonel Frank Cammarata, Army Pharmacist Consultant, OTSG, for his helpful suggestions; to Colonel Shockey, Defense Logistics Agency, for his time and patience in answering questions about the IMC and for giving me a tour of the facility; to Mr Brown, chief of staff at VA Baltimore, for explaining the VA pharmacy system and sharing pertinent information with me; to the staff of the undisclosed civilian mail

service pharmacy firm for the hours of their time in providing corporate data and brainstorming possible mail service options.

And, finally, to the US Army Medical Department and the US Army Nurse Corps for providing me both the opportunity and time to complete this important phase of my education - My Sincere Thanks to you all!

ABSTRACT

Since pressure to contain health care costs is increasing, dispensing pharmaceuticals by mail is becoming an attractive alternative. Mail service pharmacy is a form of pharmacy practice that dispenses medications through the mail and delivery services. Ingredient costs of prescriptions have been increasing at almost twice the rate of the Consumer Price Index over the past decade. The cost of prescription drugs has also increased more than hospitalization or physician fees during this time. In the civilian community many employer-sponsored mail service drug programs have become increasingly popular in recent years. The military has addressed this issue but has not conducted cost-effectiveness studies of possible options. This research examines the feasibility of establishing a Tri-service mail order pharmacy system for out-patient refill maintenance prescription drugs. Four models are assessed to determine the consequences of mail order dispensing on the military prescription refill system. The study identifies the major cost components associated with pharmaceutical delivery of each of these models (ingredient costs, dispensing

costs or cost of labor, equipment, facility and mail). The four models analyzed are: A) the baseline or current cost model; B) the centralized Medical Treatment Facility (MTF) mail service model; C) the decentralized MTF mail service model; and D) the civilian management contract mail service model. After comparing the three alternatives to the baseline, and then to each other, it was determined that Model D would be an appropriate and cost-saving alternative to the present system. Analysis showed that implementation of model D would cost the government approximately $700,000 more per year on refill costs. A bigger savings is realized, however, when one analyzes the impact of the military spaces saved by contracting for a mail order pharmacy service. From the three Army MTFs in the Washington area alone, contracting the refill job to a civilian firm would save the military approximately 97 directly recognizable manpower spaces per year. When one adds the number of support personnel jobs no longer required after such a savings, it becomes readily apparent that

contracted mail order pharmacy service is the route for the military's future.

What is the Feasibility of Establishing A Tri-Service Mail Order Pharmacy System?

I. Introduction

Conditions Which Prompted the Study

Controlling resources is a vital concern of managers in all organizations. A key factor in this concern is understanding the cost of the resources needed for activities accomplished or planned by management (Suver et al, 1988). Since pressure to contain health care cost is increasing, dispensing pharmaceuticals by mail is becoming an attractive way to ensure adequate service coverage without compromising quality. Ingredient costs of prescriptions have been increasing at almost twice the rate of the Consumer Price Index over the past decade. Last year prescription drug prices rose nearly a full percentage point higher than the overall cost of medical care- 7.8 percent compared to 6.9 percent.

Drug cost increases were nearly double the rise in the overall consumer price index for 1988 (Vibbert, 1989). The cost of prescription drugs also has increased more than hospitalization or physician fees during this time (Barbieri, et al, 1987, Vibbert, 1989). An article in Time magazine reports that the price of prescription drugs has jumped 135 percent over the last decade, and inflation has climbed 53 percent in the same stretch (Time, January 8, 1990). The aging of the population, coupled with advances in the development of new drugs, will continue to spur concern over future cost increases. The Pharmaceutical Manufacturers Association says price increases are a direct result of research and development costs and that these R&D costs double every five years (Vibbert, 1989). To counter the spiraling drug cost trend, one viable alternative may well be a change in distribution methods.

In the military health care system, an additional factor conspires to drive up the cost to regular beneficiaries. There are many beneficiaries (retired military, active-duty recruiters, ROTC personnel and

all their families) who are living in isolated areas, or in parts of the country not easily served by a Uniformed Services Medical Treatment Facility (MTF). Due to inconvenient and unfavorable commuting distances, this population has opted to use CHAMPUS (Civilian Health and Medical Program for the Uniformed Services), Supplemental Care, third-party payers, or has paid out-of-pocket, rather than use the nearest (or distant) MTF for pharmaceutical services. The retirees and their family members, most on fixed incomes and many of them elderly with chronic medical conditions, use high volume and frequently, high-cost prescription drugs (Karis et al, 1989). In the civilian community, this anomaly of eligible beneficiaries at distance from their closest supporting pharmacy has been answered by employer-sponsored prescription drug programs. To cut costs and to respond to the needs of their personnel, these programs have become increasingly popular in recent years. The military has addressed the high cost and inconvenient pharmacy issue but has yet to conduct cost-effectiveness studies of possible options. The

question of determining the feasibility of establishing a mail service pharmacy as a means of producing CHAMPUS cost savings to the Department of Defense, and a greater convenience to a majority of beneficiaries has been asked by many military pharmacists but not vigorously pursued (Danielski, 1989a).

Pharmacy workloads in many military medical treatment facilities far exceed staff capabilities, with resultant patient dissatisfaction, especially with increased waiting times for prescription fills. Additionally, civilian pharmacist salaries in the past few years have risen considerably. Thus, in large metropolitan areas, like Washington, D.C., salaries in excess of $50,000 for graduate pharmacists have severely hampered the Army Medical Department's (AMEDD) recruitment and retention programs for both officer and civilian registered pharmacists (Danielski, 1989a). According to Colonel Cammarata (27 December, 1989), Army Pharmacy Consultant, Office of the Surgeon General, Army Pharmacist accessions this past year (1989) were at the 75% level with only 20 accessions

for 27 positions.

In light of the above problems, this study is conducted to examine the feasibility of establishing a Tri-Service Mail Order Pharmacy Service for out-patient refill maintenance prescriptions. A cost analysis study of several possible alternatives is investigated. The study identifies the major cost components associated with each pharmaceutical delivery model, and compares equivalent costs (savings) and effectiveness (service efficiency). The alternatives or models considered in this study include the following:

1. Current model or baseline (CHAMPUS reimbursements and MTF(s) refill of out-patient prescription drugs)
2. Mail service model- centralized
3. Mail service model- decentralized
4. Mail service model- civilian management contract

Management Problem Question

What is the feasibility of establishing a

Tri-Service mail order pharmacy system to serve Department of Defense beneficiaries of the military health care system?

Literature Review

History

Since pressure to reduce health care costs is increasing, dispensing pharmaceuticals by mail is becoming an attractive way for individual patients and corporations to ensure adequate service coverage without compromising quality (Enright, 1987a). Defined, mail service pharmacy (MSP) is a form of pharmacy practice that dispenses medications through the mail. Providing pharmaceuticals by mail is not a new concept, however, and has been available to the public for over half a century (Cropsey, Schwarz, O'Brien, 1988). The practice of mailing medications originated in rural America. Prior to the post World War II boom in automobiles and super highways, residents in rural regions of the United States had been dependent upon the postal system to deliver

medications, health products, dental items, home laboratory products, and therapeutic aids (Wertheimer & Knoben, 1973; Cropsey, Schwarz, O'Brien, 1988). What is new in the realm of mail service pharmacy is the enthusiasm and growing acceptance of the practice and the tremendous potential for growth in this cost-containment, yet quality-conscious health care arena.

The growth of mail service pharmacies can be described as explosive. Over the last decade, sales from mail service pharmacies have grown about 50% annually, grossing $100 million in 1981 and rising to $1.9 billion by 1988. By 1995, sales should near $9 billion, representing a compounded annual growth rate of 25% (Christie, L., Ed., September 1989). In 1986, the pharmacy industry predicted a 30% annual growth for mail service over the next five years, commanding a 10% market share by 1991 and a 18.6% share by 1995. (Codling, 1987; Konner, 1988, Vibbert, 1989). Currently, mail service pharmacies' sales of $1.9 billion account for 11 percent of the total outpatient

maintenance drug industry (Vibbert, 1989). More than a dozen organizations are involved, ranging from the Veterans Administration (VA) to the American Association of Retired Persons (AARP) to for-profit corporations that offer funded benefit programs, which are largely underwritten by employers or unions. Their interest has spurred the growth of the industry; but, what forces have driven these organizations, and others like them to turn from standard pharmaceutical practices to the resurgent mail service practice?

Forces Behind the Growth of Mail Service Dispensing

Mail service pharmacies are enjoying a renewed and continued growth for two major reasons: cost savings to the payer, and convenience to the patient. Convenience is particularly attractive to older patients who have limited mobility and require one or two maintenance medications. These MSPs advertise savings of 5 to 40% on their drug costs (Barberi, Sydlaske and Wilson, 1987; Codling, 1987; Enright, 1987b; Nelson, 1987). A July 1987 Boston Consulting Group study commissioned by

Medco Containment Services, Inc. claims mail-based plans can save 20-25 percent of total employer drug bills and can deliver maintenance drugs at roughly 35 percent less than either major medical or card plan programs (Vibbert,1989). According to Konnor (March 1986), mail service operations are volume businesses. Their costs are substantially reduced because they (1) deal in large quantities of selected items (primarily pharmaceutical products used to treat chronic diseases, which account for 70% of all prescription use), (2) use highly automated order-processing and record-keeping systems, (3) rely on volume purchase discounts from manufacturers, and (4) provide a three-to six-month supply of drug products to patients at one time. This system employs low overhead, generic-drug-product dispensing, quantity buying power, efficient use of supportive personnel, and technology to provide a high-quality product at a lower cost.

From the corporate, or employer perspective, the same important forces behind the growth of mail service dispensing are price and convenience. A study done by

Arthur D. Little, Inc., reported by Codling (1987) demonstrated how mail service can lower the cost of drugs to both a corporate benefit program and the employees it serves through lower fees and ingredients costs. Mail service firms can save corporate customers and their employees 5-40% on drug costs through volume purchasing, generic substitution, automated dispensing, and multi-month supplies. The convenience of at-home shopping and large supplies is especially valued by older Americans, and is an important bargaining chip in employer-employee relations. Employers who seem to care for their personnel's post employment welfare gain an increase in productivity that only loyalty can add. When this is added to the lowered cost the employer actually pays in health care benefits (through use of the MSP), the employer is doubly recompensed by using the mail service system.

In an attempt to substantiate these claims, various studies have been conducted by non-biased agencies to evaluate the cost of mail service programs. One such study was conducted by the actuarial firm of

Sieben and Associates for Prescription Card Service, a claims processing subsidiary of McKesson Incorporated. Card services allow employers to provide employees with drug benefit programs while at the same time cutting down on administrative overhead costs. Employees have their prescriptions filled at a participating pharmacy upon presentation of an identification card; patient prescription fees are waived or reduced, with the balance being picked up by the employer, but without the attendant paperwork drill required by some systems. Sieben's study concluded that, although MSPs are less expensive per unit cost, the total cost to the buyer may be greater due to an increase in utilization and the maximum prescribing amount allowed by the health benefit program for drugs. Unit savings were 4%, but the overall utilization was 9% higher, resulting in a 5% increase in overall costs to the plan sponsors. (It should be noted, however, that the study did not address possible benefit to the employer resulting from diminished absenteeism or increase in worker morale from use of the mail service. While it is harder to

quantify some aspects of a benefit program, these facets should none-the-less be considered when releasing study results.) (Cropsey, et al., 1988; Nelson, 1987). Wastage was also cited as a contributing factor, related to changes in prescriptions, adverse reaction experience and diminished need. Wastage, however, could not be determined to be of any greater or lesser amount than that of normal prescription patterns. This study could be used as a baseline for program cost and use data and as a means of improving existing mail service programs.

Another exhaustive, independent analysis, done by one of the nation's leading healthcare consulting firms, Mercer-Meidinger-Hansen (M-M-H), provides critical information for employers using or considering a mail service option as a way to control the rising cost of prescription drug plans (1987). The M-M-H findings were the first to provide a comparative analysis of the actual cost experience of specific prescription card plans before and after the introduction of mail service option. The introduction

of a mail service option to the prescription drug card plan produced lower than expected gross costs per cardholder (ranging from 5.9 to 10.6 percent, results being statistically significant.) The study measured several cost components, including gross cost per cardholder, cost per day's supply, days per claim, and number of claims per cardholder. Costs per day were further analyzed in terms of ingredient cost, administrative cost, and dispensing fees. The general outcome of the study seemed to be a validation of what users of mail service systems had been claiming all along - that the convenience of the system, as well as its structure, produced a real cost savings and increased user satisfaction.

Most of the recent literature claims that the savings due to the adoption of a mail service plan is a function of mail service utilization, plan design, group demographics and the cost discounts associated with the mail service program (Barbieri, et al, 1987).

Major Participants

Veterans Administration Mail Service Pharmaceutical Services.

The VA has the oldest and largest mail service pharmacy system, with an annual volume of more than 20 million mail service prescriptions. This is over half (58%) of their total annual prescription volume. The primary objective of the VA's mail service program is to offer greater service and convenience for veterans who cannot routinely pick up maintenance medications from the VA medical centers. With an aging general population, the VA client spread may soon approximate the normal medical center population curve. Its system's ability to respond to the more frequently non-ambulatory patient spectrum may offer interesting parallels for the normal MTF.

The VA program, with less time spent in patient interface, but more focus on specific pharmaceutical application also optimizes VA time, space and staffing allocations. Essential to the success of the program is the sophistication of both computer and automation

applications.

The VA's intent is to offer consistent quality of service, relying on automated patient profiles, review, and routine monitoring. To ensure this, veterans can procure mail services only through the VA medical center service area to which they are assigned.

The system routinely permits five refills, which are shipped on receipt of a refill request slip from a patient; a 30 day supply is usually provided at each refill. Early refill requests are held until the appropriate reorder point to control overuse and misuse. Once all refills have been used, the patient is required to see a physician for reassessment and renewal of the prescription. In case of an emergency, flexibility in the system allows for refilling in a community pharmacy. The pharmacy mail service program is totally funded by the VA, with the veteran incurring no out-of-pocket expense.

American Association of Retired Persons (AARP) Mail Pharmacy Service.

AARP Mail Pharmacy Service is an endorsed service

of AARP. AARP itself does not sell prescription drugs and therefore makes no purchases of prescription drugs at a discount. Instead, Retired Persons Services, which is separately organized as a non-profit corporation, serves AARP members through the non-profit AARP Pharmacy Service. AARP Pharmacy Service AARP(PS) offers its members a nonprofit system of distribution for pharmaceuticals, both prescription and non-prescription. More than eight million prescriptions are dispensed per year through ten regional pharmaceutical centers and two walk-in centers, making AARP the largest private pharmaceutical mail service provider.

The AARP(PS) established itself as the buying agent of drug products for its members to reduce costs through the development of a more economical method of drug delivery and to provide the highest possible quality of drug product.

Participation in the service is optional. AARP does not claim to meet all prescription needs, but for long-term and maintenance therapy, use of the service may mean substantial savings.

The AARP service offers the patient a charge account credit system, a toll-free telephone number to discuss prescription needs and overall drug therapy, and a full range of leaflets covering specific and general drug-use information that are distributed at no additional charge.

A widely distributed brochure designed for members explains the concept of generic drug products and the practice of drug selection. The brochure compares prices of more than 150 brand-name and generic products and explains that AARP has dispensed more than 26 million generic prescriptions without any problems, at a savings of millions of dollars to the consumer. About 10-15% of the members use the mail service pharmacy service (AARP 1989 Annual Report).

Private, for-profit mail services.

This area is composed of more than a dozen corporations, including subsidiaries of chain drugstores (e.g. Walgreens, Thrift), hospitals (Rush-Presbyterian-St.Lukes in Chicago and Riverside in Columbus, Ohio), and large corporations with

health-related interests (e.g., Travenol) and general interests (e.g., Sears, J.C. Penny). Programs are largely employer funded but may involve patient co-payments that are usually lower than those associated with major medical co-payment programs.

Medco Containment Services, Inc. leads the mail service prescription drug benefit industry and remains the only single-source provider of integrated mail service and plastic card programs. Medco is the largest competitor in the for-profit segment and holds a 62% share of the segment. The number of prescriptions dispensed in 1988 rose to 12 million, with 16 million people covered by Medco's mail service (Medco Annual Report, 1988).

Trends

Issues and concerns.

Employers are becoming major purchasers of pharmaceuticals for employees' and retirees' prescription-drug benefit programs. Although mail service pharmacy has been in existence for more than a half a century, only within the past several years have

employers realized how spiraling health care costs have affected their shrinking bottom lines (Enright, 1986). Facing increases in prescription-drug prices that are four times greater than increases for all consumer goods and twice the rate of other health care expenditures, employers are becoming increasingly interested in mail service pharmaceutical services (Waldholz, Steptoe,1987).

Mail service pharmaceuticals promise employers savings of 5-50% over costs associated with major medical or plastic-card services (Starrs,1985). Given rising prescription-drug costs of 10-13% annually (Medco lists the rise as high as 15%. Medco, personal communication, October 12 1989), and the demographic implications of an aging population that uses prescription drugs heavily, drug benefit programs, particularly for retirees, are undergoing increasing scrutiny (Waldholz, Steptoe, 1987).

Equally important as the cost savings associated with mail services is the detailed information about use and costs that these services can provide. Such

data can be difficult for employers to collect but is critical to the effective evaluation and analysis of purchases of prescription drugs. Aside from being more costly, purchases at the retail level do not provide an audit trail with the detailed information needed.

In addition to offering wholesale pricing (actually, vendors can charge up to 20% below the average wholesale price), dispensing savings, reduced administrative costs, drug product selection, and fraud and abuse controls, mail service pharmacies provide management and use reporting for employers and third-party administrators that focuses on the activity of all eligible participants. Detailed information on drug product selection, physician prescribing, calculated savings for both employer and employee, summaries of claims paid, use analysis by drug and therapeutic class, and exception reporting is included (Enright,1987b).

The Drug Enforcement Administration designed a study to compare mail service pharmacies with traditional walk-in retail pharmacies, in terms of

forged prescriptions. The results of this study, known as "Project Script" (1988), and conducted on a national basis with the expenditure of substantive amounts of time and monies, concluded that retail pharmacies were twice as likely to pass forged prescriptions for controlled substances as were mail service pharmacies. The conclusion set forth in "Project Script" remains unchanged by any other competent study (Marotta, 1988).

A study by the Center for Pharmacy Management and Research at the University of Tennessee College of Pharmacy, entitled "Evaluation of Consumer Opinions of Prescription Drug Services From Community and Mail Order Pharmacies," concluded that "most mail order users report few problems and the overall rating of the service was excellent or good. In fact the rating for mail order services was slightly better than the rating for community pharmacy services." The same study found that the occurrence of delay experienced by mail service users, as opposed to retail pharmacy users, was found to be the same (Roberts, et al, 1986).

The American Medical Association (AMA), in

adopting the report of its Board of Trustees, entitled "Mail Service Pharmacy" (December, 1987), concluded, in pertinent part, as follows:

> Controlled studies in the 1970s support the fact that MSPs are less vulnerable to drug diversion than retail pharmacies. Although numerous concerns about lack of safety and drug diversion have been expressed in trade publications and newsletters, documented controlled data regarding these concerns are minimal. There is no evidence of lack of safety in the peer-reviewed controlled study literature. (p. 4)

Advantages of mail services include comprehensive quality-control procedures and automated and information systems that are designed to prevent plan abuse, drug stockpiling, and therapeutic error. Detailed, printed use instructions and routine telephone follow-up aimed at minimizing error, misunderstanding, and noncompliance complete the service.

Retail pharmacists have individually and collectively opposed mail services on the basis that it denies patients the opportunity to consult personally with a pharmacist on the appropriate use of medications, thus resulting in a threat to the public health. The questions center on the feasibility of offering assurances of safety and rationality of therapy, of eliminating or, at least, minimizing misuse and overuse of drugs, and of nurturing patient compliance in a situation where the patient and the pharmacist have no direct contact. Since mail services deal primarily with drugs for the treatment of chronic illness, and frequently with the elderly, critics fear that the convenience of receiving prescriptions by mail, and the dollar savings associated with the service, may well impose a higher cost associated with increased waste, adverse effects, and worsened physical condition.

To limit what they perceive to be mail service pharmacies' competitive advantage, opposing parties have mounted legislative efforts that have focused in

some jurisdictions on banning the practice. Efforts have been made to require mail service pharmacies to adhere to the laws in the states to which the prescriptions are mailed rather than to the laws in the states where their dispensing operations are located or to require out-of-state operations to employ pharmacists licensed in the jurisdiction in question. These strategies have met with only limited success, largely because of difficulties in enforcement and also because of concerns that they may discourage interstate commerce.

Military Interest.

The Office of the Surgeon General (OTSG), has attempted to determine the feasibility of mail service pharmacy as a solution to decreased numbers of pharmacists with an increasing workload, patient dissatisfaction with access and waiting times, and cost of CHAMPUS reimbursement (Danielski, 1989b). In a letter dated 21 August, 1987 the former Chief of Pharmacy Service at William Beaumont Army Medical

Center, El Paso, Texas, LTC Rex Parker, addressed several points of interest to fellow Army pharmacists requesting their comments on the possibility of a mail service program. He said,

> A considerable saving of CHAMPUS funds could be saved along with additional patients being served such as MEDICARE patients not authorized drugs. We would also pick up a large quantity of patients who in the past have not used CHAMPUS due to inconvenience (p.1).

Also, of a centralized DOD Tri-Service situation, LTC Parker said, "Think about establishment of regional centers, such as East and West with the Mississippi River as a boundary; a Veterans Administration type Outpatient Pharmacy System; or a contracted service" (p.4). He seemed to think that a centralized, Tri-Service mail service pharmacy system could be feasible.

In a follow-up memorandum (21 January 1988), however, LTC Parker reported the results of his survey of fellow Army pharmacists to Colonel Cammarata, the

Army Pharmacy Consultant at the Office of the Surgeon General. He voiced the concerns of his peers as three-fold: an unknown, perhaps significantly large workload, without the appropriate personnel and financial support; professional local, state, and national organizational disapproval; and quality control issues. "Contracting this type of service would be an easy answer;... however, pharmacy would quickly lose control of the operation and expected cost saving" (Parker, 1988, p. 1).

Subsequently, Colonel Danielski met with Mr. Konner, Executive Vice President of the National Association of Mail Service Pharmacies in December of 1988. In a memorandum for record (5 December 1988), Colonel Danielski noted the following:

> Mr. Konner is of the belief that the U.S. Army's willingness and ability to use pharmacy technicians in filling prescriptions would increase the cost effectiveness of an Army operated mail service pharmacy. He felt that the use of technicians and technology such as robotics

> will be the future of such pharmacies. Commercial MSPs are frequently bound by state laws that do not allow the retrieving of or counting of the drug by a pharmacy technician. He is also of the belief that we should develop a limited formulary of only 50-60 drugs; that we should honor prescription quantities of 60 days and preferably 90 days. He stated that the average prescription in a civilian drug store is 24 doses, whereas the average at Medco (the largest MSP) is 72 doses. He also estimated that approximately 5% of the total cost would be attributed to mail. (p. 1)

In the cover letter to Colonel Danielski, Mr. Konner states that the National Association of Mail Service Pharmacies does not have available any information which is designed to assist in establishing a new mail service pharmacy practice (23 December 1988).

Doctor Marvin Shepherd, Chairman Pharmacy Administration, University of Texas, Austin, was contacted for comments concerning DoD mail service

pharmacy. He had recently visited the new 90,000 square foot AARP facility in Fort Worth. He stated "It looked like a production plant and not a pharmacy. This facility fills 4-5,000 prescriptions per day with a staff of 100. It is heavily automated, utilizing bar coding, and "Baker cells" " (Danielski, 1989a, p. 2). He felt the advantages for the Army Medical Department would be the reduction in overcrowding and congestion in the MTFs and better utilization of facilities by operating more than one shift per day, particularly if the computers were to be used 24 hours/day. He also felt the AMEDD could have advantages over AARP by being able to control quantities and the formulary.

With the above information in mind and at hand, Colonel Danielski concluded the following in an unpublished account of Mail Services Pharmacies within Health Services Command, dated 13 January, 1989:

> The establishment of MSPs within HSC would be well received by HSC beneficiaries. However, a military mail service pharmacy would not produce savings usually affected by civilian mail services

> as large buying capacity and generic substitution are already being accomplished; furthermore, larger quantities can be accomplished with the traditional system. There is also the potential for increased cost as a large beneficiary population requires increased inventory and potential for waste. (p.4-5)

Colonel Danielski concluded that a mail service pharmacy, although a popular response to the patient complaints and concerns, would incur the costs of establishing large facilities with automation, increased pharmacy inventories and postage costs associated with pharmacy mail services. Economic advantages generally demonstrated by this system would not translate to the AMEDD. Danielski identified the major cost components associated with MSPs, but because of time constraints, was unable to develop estimated costs for each of these components (Coquilla, et al, 1989).

Another military issue of great interest and pertinence is the slogan "Buy Big, Buy Smart," which

reflects efforts to contain costs in health care delivery. The initial inception of the "Buy Big, Buy Smart" bulk container pharmaceutical purchasing program began at Kimbrough Army Community Hospital (KACH), Ft. George G. Meade, Maryland, approximately November, 1988. Major David Kotzin, Chief Pharmacy Service, KACH, worked very closely with the MEDDAC Commander, Colonel Robert B. McLean, as well as with the Chief, Logistics Division, to implement this concept operationally. Further coordination occurred and is on-going with Health Services Command (HSC) Logistics Division as well as the Office of the Surgeon General Army Pharmacy Consultant. The idea, simply stated, is to purchase pharmaceuticals in large bulk packaging from pharmaceutical supply companies and, in doing so, to save money, space and personnel time. For example, Upjohn, the first company to respond to Kimbrough's request for large purchases, now supplies boxes of 8,000 tablets (versus 100 tablets) at a 4.3% savings annually over generic Motrin. The hospital has responded favorably to Upjohn's initiative by writing

considerably more prescriptions due to the reduction in acquisition costs and labor costs (Kotzin, personal communication, 26 August 1989).

Hand-in-hand with the "Buy Big, Buy Smart" concept is the use of oversized "Baker cells." To purchase bulk pharmaceuticals, and then to take the time to place them into small "Baker cells" almost defeats the original purpose of saving money if one inefficiently uses personnel ("time is money"). Therefore, bulk containers were purchased made of the chemically stable reagent material Nalgem. Searle provided a test situation so that calculation for manhours involved in breaking down small bottles purchased in bulk could be done. The MEDDAC purchased 853 bottles of 100 tablets of Calan, one lot, at a 11.6% savings over the depot price, which does not include the surcharge of 9.6%. Total weight of shipment was 624 pounds. Removing the bottles from the shipment package and transferring the pills from bottles of 100 to bulk containers took two people five and one-half hours! Generated was 25 pounds of cotton, 12 pounds of paper (package inserts),

100 pounds of actual tablet weight and approximately 480 pounds of empty glass bottles, cardboard containers, etc. The pills were placed in 2.5 large "Baker cell" containers (this size cell holds 26,000 large pills). In contrast, if shipped already in a bulk package, it would take two people a mere nine minutes to fill a large "Baker cell"! Total shipment measured approximately 60 cubic feet. Tablets in the large bulk containers measured only three cubic feet, a substantial saving in storage space. One can easily see that bulk packaging purchase provides substantial savings and use of large "Baker cells", as devised by the Kimbrough Pharmacy personnel and now being researched by Baker Incorporated as a prototype, can save significant storage space. At this writing, contracts have been developed with 6 pharmaceutical firms to buy in large quantities and in bulk packaging; negotiations are now in progress with 26 other companies.

Treatment Facilities have been given the job of making the military buying system more efficient, even

If that means bypassing the Depot system to take advantage of an economical benefit. The military system of pharmaceutical delivery is based on the Depot system. The major purpose of the Depot is to maintain an adequate supply of pharmaceutical products which can be shipped at a moment's notice upon rapid deployment of U.S. troops anywhere in the world. The problem for military pharmacies is that the Depot tries to have a convenient dosage size on hand for rapid deployment purposes, and tries to hold its war stockage as long as possible before reordering prior to expiration dates. By military rules, depots must ship nearly out-dated material a minimum of 30 days before expiration for use elsewhere. The average time remaining on many products to be used is 2 to 4 months once it reaches a base pharmacy. The "Buy Big, Buy Smart" concept does not represent a lack of support of the Depot system since none of the large bulk containers are presently available through the Depot. Coordination with the pharmacy office at the Defense Medical Standardization Board at Fort Detrick, Maryland has progressed to the

assignment of federal stock numbers to large bulk containers with local purchase acquisition authority. Permission received from Health Services Command allowed purchasing of the large containers as well as increasing stock levels.

All of the manufacturers presently involved with Kimbrough and the large bulk container pharmaceuticals have initiated stability studies with subsequent approval by the FDA for pharmaceutical dating in excess of twelve months. Since purchases will not exceed six to twelve months at any one time, there is little concern on the part of the Pharmacy and Logistics Divisions that any of the products will expire before their use. The pharmaceutical manufacturers have established the USP and FDA stability criteria in developing the bulk containers for purchasing. The integrity of the individual tablets is being examined for breakage and none of the bulk container pharmaceuticals are being shipped until FDA has approved the pharmaceutical manufacturers' studies. Presently, Kimbrough is working with one manufacturer

supplying bulk container pharmaceuticals to determine active ingredient percentages in the tablets remaining in the large containers.

The impact on Purchasing and Contracting (P&C) divisions would be of a positive nature since purchase requests would only have to be completed once or twice a year rather than four or six times or more, depending upon quantities purchased. Since a limited number of the large manufacturers would most likely be involved in bulk container pharmaceuticals, it would appear that there would not be any increase in the volume of nonstandard procurements for the P&C Divisions. Additionally, since the majority of the large pharmaceutical companies market FDA approved pharmaceuticals which are protected by federal patent, sole-source procurement would prevail.

Military base pharmacies have two goals which are in direct conflict with the Depot. They want to reduce the number of times a product has to be inventoried and they want to maintain a 45-90 day supply of each product in the warehouse. They also want to eliminate

any excess labor costs within the pharmacy. The biggest labor waste is making a Depot convenient size product into a pharmacy convenient size product (i.e. 100 tablets may be convenient for Depot use but 10,000 tablets in one container may be convenient for pharmacy use) (Kotzin, 29 November 1989). There is no requirement for the "Buy Big, Buy Smart" concept to be compatible with DEPMEDS since Depot would continue to stock smaller package sizes of the pharmaceuticals for use in the sets, kits, and outfits. At the present, Kimbrough utilizes over 91 percent of the items on the D-Day significant list by drug but not by package size. The bulk container pharmaceutical purchasing ("Buy Big, Buy Smart") would be limited to those facilities where large volume prescription dispensing occurs. There would be no requirement to take this concept to war.

There exists a quality assurance/quality improvement impact since bulk container pharmaceutical purchasing represents purchases of one specified lot size. The "Baker cells" might be filled once every twenty to thirty days with one specified lot, rather

than several times a day, thereby avoiding a potential mixing of several different lots. Another benefit is that reloading a "Baker Cell" would be far less labor intensive.

The "Buy Smart, Buy Big" concept is compatible with the potential idea of filling CHAMPUS prescriptions by mail service rather than through community retail pharmacies. Two or three mail order clearing houses located strategically across the country could fill 10,000 to 20,000 or more prescriptions per day, perhaps in Mechanicsburg, Pennsylvania and Sacramento, California. The military will more than likely only deal with large quantities of any given pharmaceutical product to be placed on their formulary (Kotzin, 29 November 1989).

Purpose

Cost of individual components for establishment of a mail service pharmacy operation has not been determined by the AMEDD. Unlike civilian hospitals, a cost benefit analysis of any military activity must

examine cost savings to the soldier and his family as well as to the military institution. In fact, it may be argued that benefit to the soldier is of higher priority than mere cost savings to the government. Therefore, the purpose of this research is to examine the feasibility of establishing a Tri-Service Mail Order Pharmacy System, based on the results of estimated-cost and service efficiency models.

Working Hypothesis

Feasibility of establishing a mail service pharmacy system of out-patient prescription drugs is a function of, or dependent upon, 1) differential costs (savings) and 2) service efficiency to the beneficiary, between the current method of pharmaceutical delivery (CHAMPUS and MTF refills) and each of the individual mail service models.

Y=f(X)

Feasibility = f(cost/service efficiency model 1 minus cost/service efficiency model 2);

Feasibility = f(cost/service efficiency model 1

minus cost/service efficiency model 3);

Feasibility = f(cost/service efficiency model 1

minus cost/service efficiency model 4);

Feasibility = f(cost/service efficiency model 2

minus cost/service efficiency model 3);

Feasibility = f(cost/service efficiency model 2

minus cost/service efficiency model 4);

Feasibility = f(cost/service efficiency model 3

minus cost/service efficiency model 4).

II. Method and Procedures

Assumptions

1. Efficiency of service to beneficiary must remain the same or improve.

2. Cost of out-patient refill prescriptions must remain the same or improve.

Definitions

1. Out-patient prescriptions Cost is defined as ingredient cost plus dispensing cost (See additional cost definitions below).

2. Service efficiency is determined by weighing beneficiary prescription retrieval times (waiting time and transportation time and with mail service, mail time) against a standard (baseline).

3. Pharmaceutical delivery models are defined as follows:

A. The current model or baseline: CHAMPUS reimbursement and MTF(s) refill of out-patient prescription drugs model in the metropolitan Washington, D.C. area to include the MTFs of Walter Reed, Ft Belvoir's Dewitt ACH, and Ft Meade's Kimbrough

Army Community Hospital;

B. A regionalized medical treatment facility's mail service pharmacy system model, servicing a large metropolitan area such as Washington, D.C., Maryland, Virginia, and Pennsylvania, centralized on a government installation;

C. A Veterans Administration mail service pharmacy system model, decentralized service, from an existing MTF pharmacy;

D. A regionalized mail service pharmacy system model, servicing a large metropolitan area, located on a government installation, but administered under a civilian management contract. (All independent variables).

4. Feasibility of establishing a Tri-Service mail order pharmacy system (dependent variable) is determined by examining the cost differential and service efficiency between the current model and each proposed model, as well as between proposed models (if any are viable alternatives).

5. These additional definitions apply to all

models throughout the paper.

a. Total Pharmacy Cost - This is defined as the aggregate of dollars expended by the pharmacy (be that MTF, Civilian Contractor, VA or CHAMPUS) to procure, process and place a prescription in the hands of a beneficiary. Procurement and processing fees include the overhead necessary to run a facility, to staff the organization and to provide transportation for ingredients to the point of prescription preparation. Placing the completed prescription in the hands of the beneficiary includes the price of transportation (by whatever means) of the prescription from point of preparation to the point of use.

b. Volume is the aggregate amount of ingredients used to account for all prescriptions filled during a specific timeframe. It is the base used to determine manpower expenditures (thus manpower costs in hours, translated to dollars) to prepare and dispense a particular prescription. Volume is used to take into account the variance in refill prescription time from one prescription to another.

c. Ingredient costs, esentially, are the raw materials from which the prescriptions are constructed. (These are also known as the average wholesale price.) They include the individual drugs and special utilization paraphenalia (such as syringes with insulin).

d. Dispensing costs are the costs associated with turning raw materials of the prescription into the prescription itself. From the moment work is commenced to fill a prescription, from the moment a pharmacist picks up a prescription until that particular medicine is in the hand of the consumer - all these costs are dispensing costs. They include, among others, labor, overhead required to maintain the facility, equipment rental costs, management fees, licensing fees, bottling costs and consulting fees. Within the mail service system, dispensing costs would also include shipping, from packaging to processing to actual costs of mail.

Feasibility of establishing a Tri-service mail service pharmacy system as a function of cost differential and service efficiency between models:

Conceptual Model (Figure 1)

Model B

cost savings/service efficiency

cost savings/service efficiency

cost savings/service efficiency

Model A

cost savings/service efficiency

cost savings/service efficiency

Model C

Model D

cost savings/service efficiency

Data Gathering

1. Cost data and service efficiency data is established for the baseline model.

2. Cost data and service efficiency data is established for each proposed mail service model.

A. The Current Model (CHAMPUS reimbursement and MTF(s) refill of out-patient prescription drugs model)

1. How much was spent by the government in the last fiscal year (1989) under CHAMPUS to supply out-patient prescriptions to beneficiaries, per MTF(s) population? What were the numbers of beneficiaries, per catagories; how many prescription claims were paid; what were the beneficiaries cost, the government cost and total cost for ambulatory prescription drugs? Data is retrieved from CHAMPUS Cost and Workload Regionalization Report, OCHAMPUS, Denver, Colorado.

a. Walter Reed Army Medical Center, Washington, D. C. (WRAMC);

b. Dewitt Army Community Hospital,

6. Determine expense of current pharmaceutical wastage of depot medications.

7. Total cost of CHAMPUS out-patient prescriptions per MTF plus MTFs' costs for out-patient refill prescriptions (CHAMPUS plus KACH, DACH, WRAMC).

B. Centralized MTFs model, regionalized in Mechanicsburg, Pennsylvania

1. What percentage of the total budget of each MTF pharmacy are the expenditures for refill prescription drugs? Data obtained from MTF Resource Management Division.

2. Determine the volume of, and cost (ingredient cost) to dispense, top 100 ambulatory prescriptions of refill medications for three MTFs. Data from MTFs Product Activity Reports.

3. Determine dispensing costs (labor, equipment, facility, and mail costs) needed to provide mail service operation for a standardized formulary of top 100 drugs.

4. Determine service efficiency.

5. Compare model B costs (ingredient and dispensing) and service efficiency to baseline model costs and efficiency.

C. Decentralized Veterans Administration Mail Service model from an existing MTF

1. Determine volume of top 100 ambulatory prescriptions of refill medications, using Baltimore, Maryland VA Medical Center data.

2. Determine average prescription cost (unit cost).

3. Determine prescription costs (ingredient costs) of top 100 ambulatory refill prescription drugs plus dispensing costs (labor, equipment, facility and mail costs).

4. Determine service efficiency of the mail service.

5. Compare model C costs and service efficiency to baseline model costs.

D. Regional center, under a civilian

management contract

1. Determine volume of top 100 mail service refill drugs of a large mail service pharmacy.

2. Determine cost of acquisition (ingredient costs which should be the same as model B's ingredient costs) plus dispensing costs (labor, equipment, facility and mail costs) of top 100 drugs.

3. Determine which customer service package (plan design) would be needed (exclusion medication files, toll-free phone access to a MSP pharmacist, standardized formulary, days supply of medications, computer-code eligibility, hours of service, drug utilization review options, etc), as part of the dispensing costs.

4. Determine service efficiency for mail service.

5. Compare model D costs and service efficiency to baseline model costs.

The two variables of interest, cost savings and service efficiency, are measured by examining a

population sample of the top 100 out-patient refill prescription drugs for the cost, and by examining customer satisfaction and percent of correct prescriptions for the service efficiency. In addressing validity of the cost savings, the data is objectively retrieved from statistical reports and objectively measured in each cost model using the ingredient and dispensing costs. Service efficiency is objectively and subjectively measured in each model taking into consideration costs/benefits to the soldier. Reliability, consistency of measurement, is assured by applying the same criteria to each model and verified data using base-year real figures. Ethical rights of individual beneficiaries are protected, as names are not included in the study; anonymity is preserved. Also, nondisclosure of proprietary information received from the civilian mail service pharmacy is maintained by the author and is to be likewise protected by the U.S. Army-Baylor University Graduate Program in Health Care Administration readers of this study, and all DoD officials.

Criteria

The basic concept of a mail service pharmacy includes the following criteria:

1. The MSP would primarily be operated to handle routine, out-patient prescriptions which are usually refill, maintenance medications.

2. The system would not be timely enough for emergent prescription needs, like antibiotics, and the beneficiary would have to use a pre-allocated alternate pharmacy. (In all likelihood, the restructured MTF pharmacy or CHAMPUS.)

3. Each MTF should fill the first quantity (30 days) from the original prescription, with remainder (the refills) available from the MSP.

4. Computer-integration from MTFs to MSP would be necessary for information transfer of patient profiles, and eligibility (DEERS).

5. The MSP would honor all MTF generated prescriptions, therefore would have to have a standardized formulary.

Time period during which data is gathered is the last fiscal year, 1989 (or, in some cases, the last year data is available). In order to address the concern identified in the literature and by the HSC survey, a constraint is established to serve as a framework for each of the models. This constraint involves offering mail service for refill prescription drugs only. This would require the initial prescription to be written and filled elsewhere (either military or civilian). For those prescriptions filled at an MTF, this would ensure patient eligibility and drug availability at the centralized mail service pharmacy. It also maintains some direct, initial patient-pharmacist relationship.

A mail service pharmacy concept, as proposed in this research, would operate most efficiently, cost-effectively and more simply, if confined to service for refill maintenance medications. The literature certainly addresses this issue and the author of this study decided to project cost figures

based on refill maintenance out-patient drugs. The Tri-Service concept of operating such an endeavor would have to be embraced by the three Armed Services, otherwise initial start-up costs would be unfairly shouldered by one service, but ultimately utilized by all Tri-Service beneficiaries. Defined, a refill prescription is a subsequent drug prescription, not the first prescription issued by a licensed health care provider following an evaluation of the patient. The Tri-Pharmacy Product Activity Report software used at both KACH and DACH adheres to this definition of a refill medication, regardless if the patient is continuing on an uninterrupted medication. The first prescription after evaluation or reevaluation is a new prescription. Therefore, refill prescriptions may, in reality, be higher than the prescription number generated by the computer. Nevertheless, this researcher foresees the requirement by a user of mail service pharmacy to procure two prescriptions from the health care provider, one for start-up or acute needs to be filled at the local MTF or neighborhood pharmacy,

and a second prescription for mail-in to the mail service pharmacy for subsequent refills before the next clinic visit.

III. Results

Results Model A

To completely understand the ramifications of outpatient pharmacy refills under the current model, one must analyze not only those refills which are processed at the MTF counters, but also those refills which are filled under CHAMPUS. It is logical to assume that under any mail service pharmacy system, a number of CHAMPUS users will switch to the MSP. There is even the possibility that users may be required to use the MSP, vice CHAMPUS, for all refill prescriptions. Thus, analyzing the current model demands a look at CHAMPUS use and cost.

CHAMPUS Cost and Workload Regionalization Reports of Outpatient Prescription Drugs for fiscal year 1988 revealed the following for the Washington Metropolitan area MTFs of Walter Reed Army Medical Center (WRAMC), Dewitt Army Community Hospital (DACH) and Kimbrough Army Community Hospital (KACH):

Table 1

CHAMPUS Data

Total User Beneficiaries		
	WRAMC	593
	DACH	3743
	KACH	1348
	Total	5684
Total Costs		
	WRAMC	$121,944
	DACH	564,718
	KACH	195,532
	Total	$882,194

The percentage of CHAMPUS out-patient drugs which were refill medications is determined by applying the same percentage as found at the individual MTFs. (There is some indication that CHAMPUS refill numbers may indeed be higher than refills at MTFs, simply based on patient preference to utilize nearby pharmacies for refills

after having received initial prescriptions at MTFs. Unfortunately, without expanding this GMP far beyond its immediate scope, that data was not readily available. These indications would serve, however, to validate potential patient acceptance of the mail order concept, simply to take advantage of the opportunity not to have to go to the distant MTF.)

Budget at each MTF as obligations/costs for Pharmacy Service for fiscal year 1989 are as follows:

Table 2

MTF Pharmacy Service Budgets

WRAMC	$13,277,759.80
DACH	2,596,254.22
KACH	2,248,099.94

Kimbrough Army Community Hospital

Kimbrough Army Community Hospital Pharmacy Service budget of $2,248,099.94 (total pharmacy budget) minus $1,980,261.25 (total ingredient costs) equals

$267,838.69 which are the dispensing costs. (It should be noted in the dispensing cost estimates, that the building and grounds costs, which are subsumed in the costs for operation of the entire hospital were not identified, and thus not a part of the dispensing cost budget. These costs would be delineated in any contractor budgeting or if a new area were to be built specifically to house the mail service pharmacy.) The dispensing cost includes personnel cost (labor), rental costs, and equipment costs.

Since the sample population consists of the top 100 drugs in the formulary both by cost and by volume, the rationale for using each is explained. The ingredient cost of the top 100 drugs by volume is $734,736.50. Of this, $352,673.52, or 48% by volume, is spent on refills of the top 100 drugs. Applying this sampled percentage to the general population of dispensing costs then, 48% by volume of the total dispensing cost is (.48)($267,838.69) or $128,562.57. This represents the projected dispensing cost of refill maintenance drugs at KACH. (This methodology assumes a

general across the board division of expenditures in direct proportion to the amount of finished product to be produced: in this case, refilled prescriptions.)

The ingredient costs of the top 100 drugs by cost is 47% or (.47)($1,980,261.25) which is $936,952.20 spent on the top 100 drugs. As above however, 54% by cost is spent on refills of the top 100 drugs. Again, applying this percentage to the ingredient costs then, 54% by cost of the ingredient cost of the top 100 is (.54)($1,980,261.25) or $1,069,341.08. This represents the projected ingredient costs of refill maintenance drugs at KACH.

Therefore, $1,069,341.08 (ingredient costs) plus $128,562.57 (dispensing costs) equals $1,197,903.65, the current cost of out-patient refill prescription drugs at KACH, based on a top 100 refill sample.

The cost of CHAMPUS is computed as follows:

KACH CHAMPUS costs of out-patient drugs is $195,532. The percentage of dispensing costs to total pharmacy budget is $267,838.69/$2,248,099.94 or 11.9%.

Thus, .119 of $195,532 is $23,295.69, the dispensing costs for CHAMPUS out-patient drugs. The percentage of ingredient costs is 100-11.9= 88.1%. Therefore, .88 of $195,532 is $172,068.16, the ingredient costs for CHAMPUS out- patient drugs. An assumption is that CHAMPUS refill percentages should equal MTF refill percentages. If 48% of all outpatient prescriptions at KACH are refills (by volume), then, 48% of the dispensing costs ($23,295.69) is $11,181.93, the CHAMPUS dispensing cost for refill medications. Likewise, if 54% of all outpatient prescriptions at KACH are refills (by cost), then, 54% of the ingredient costs ($172,068.16) is $151,419.98, the CHAMPUS ingredient cost for refill medications. Total KACH CHAMPUS outlay for refill prescriptions is $162,601.91.

Dewitt Army Community Hospital

Dewitt Army Community Hospital Pharmacy Service budget of $2,596,254.22 (total pharmacy budget) minus $2,251,170.84 (total ingredient costs) equals $345,083.38 which are the dispensing costs. The

dispensing cost includes personnel cost (labor), rental costs, and equipment costs.

The percentage of the ingredient cost of the top 100 drugs by volume is 52%. Applying this sampled percentage to the dispensing costs then, 52% by volume of the total dispensing cost is .52 ($345,083.38) or $179,443.36. This represents the projected dispensing cost of refill maintenance drugs at DACH.

The ingredient cost of the top 100 drugs is $603,088.67. If 57% by cost is spent on refills of the top 100 drugs, then, by applying this percentage to the total ingredient costs, 57% of $2,251,170.84 is $1,283,167.38. This represents the projected ingredient costs of refill maintenance drugs at DACH.

Therefore, $1,283,167.38 (ingredient costs) plus $179,443.36 (dispensing costs) equals $1,462,610.74, the current cost of out-patient refill prescription drugs a DACH, based on a top 100 refill sample.

Again, an assumption is that CHAMPUS refill percentages should equal MTF refill percentages. Dewitt CHAMPUS costs of out-patient drugs is $564,718.

The percentage of dispensing costs to total pharmacy budget is $345,083.38/$2,596,254.22 or 13.3%. Taking 13.3% of $564,718 is $75,059.98, the dispensing costs for CHAMPUS out-patient drugs. The ingredient cost percentage is 100-13.3= 86.7%. So, .87 of $564,718 is $489,610.50, the ingredient costs for CHAMPUS out-patient drugs. An assumption is that CHAMPUS refill percentages should equal MTF refill percentages. If 52% of all outpatient prescriptions at DACH are refills (by volume), then, 52% of the dispensing costs ($75,059.98) is $39,031.19, the CHAMPUS dispensing cost for refill medications. Likewise, if 57% of all outpatient prescriptions at DACH are refills (by cost), then, 57% of the ingredient costs ($489,610.50) is $279,077.99, the CHAMPUS ingredient cost for refill medications. Total DACH CHAMPUS outlay for refill prescriptions is $318,109.18.

Walter Reed Army Medical Center

Walter Reed Army Medical Center Pharmacy Service budget of $13,277,759.80 (total pharmacy budget) minus $11,722,048.22 (total ingredient costs)

equals $1,555,711.60 which are the total dispensing costs. The dispensing cost includes personnel cost (labor), rental costs, and equipment costs.

82% by volume is spent on refills of the top 100 drugs. Applying this sampled percentage to the general poplation of dispensing costs then, 82% by volume of the total dispensing cost is .82 times ($1,555,711.60) or $1,275,683.51. This represents the projected dispensing cost of refill maintenance drugs at WRAMC.

If 87% by cost is spent on refills of the top 100 drugs, then again, by applying this percentage to the total ingredient costs, 87% of $11,722,048.22 equals $10,198,181.95. This represents the projected ingredient costs of refill maintenance drugs at WRAMC.

Therefore, $10,198,181.95 (ingredient costs) plus $1,275,683.51 (dispensing costs) equals $11,473,865.46 the current cost of out-patient refill prescription drugs at WRAMC, based on a top 100 refill sample.

The cost of CHAMPUS is computed as follows:

WRAMC CHAMPUS costs of out-patient drugs is $121,944. The percentage of dispensing costs to total pharmacy budget is $1,555,711.60/$13,277,759.80 or 11.7%. Multiplying .117 by $121,944 is $14,287.78, the dispensing costs for CHAMPUS out-patient drugs. Next, 100-11.7= 88.3% is the percentage of ingredient costs. So, .88 of $121,944 is $107,310.72, the ingredient costs for CHAMPUS out-patient drugs. An assumption is that CHAMPUS refill percentages should equal MTF refill percentages. If 82% of all outpatient prescriptions at WRAMC are refills (by volume), then, 82% of the dispensing costs ($14,287.78) is $11,715.98, the CHAMPUS dispensing cost for refill medications. Likewise, if 87% of all outpatient prescriptions at WRAMC are refills (by cost), then, 87% of the ingredient costs ($107,310.72) is $93,360.33, the CHAMPUS ingredient cost for refill medications. Total WRAMC CHAMPUS outlay for refill prescriptions is $105,076.31.

Table 3

Model A Refill and CHAMPUS costs

	KACH	DACH	WRAMC
Pharmacy Svc Budget	$2,248,099	$2,596,254	$13,277,759
Total Ingred. Costs	1,980,261	2,251,170	11,722,048
Total Dispen. Costs	267,838	345,084	1,555,711
% by Vol. of top 100 refills	48%	52%	82%
% of Dispens cost	.48(267,838) = $128,562	.52(345,084) = $179,443	.82(1,555,711) = $1,275,683
% by Cost of top 100 refills	54%	57%	87%
% of Ingred. cost	.54(1,980,261) = $1,069,341	.57(2,251,170) = $1,283,167	.87(11,722,048) = $10,198,181
Ingred cost + Dispens cost =	$1,197,903	$1,462,610	$11,473,865
CHAMPUS cost of outpatient drugs	$195,532	$564,718	$121,944
CHAMPUS Dispens cost for refill	.48(23,295) = $11,181	.52(75,059) = $39,031	.82(14,287) = $11,715
CHAMPUS Ingred. cost for refill	.54(172,068) = $151,419	.57(489,610) = $279,077	.87(107,310) = $93,360
Total CHAMPUS cost=	$162,600	$318,108	$105,075

The current model is the sum total of CHAMPUS outlays plus MTFs outlays for refill drugs:

Table 4

Total of CHAMPUS outlays and MTF outlays for refills

WRAMC: $105,076.31 (CHAMPUS) +
$11,473,865.46 (refill drugs)= $11,578,941.77.

DACH: $318,109.18 (CHAMPUS) +
$1,462,610.74 (refill drugs)= $1,780,719.92.

KACH: $162,601.91 (CHAMPUS) +
$1,197,903.65 (refill drugs)= $1,360,505.56.

Totals (CHAMPUS + MTF refills for all three MTFs) =
$14,720,167.25.

The annual wastage expense at DACH (FY 1989) is $8,109. The annual wastage expense at WRAMC was unobtainable at the time of this research. The annual wastage expense at KACH is $34,000 which involves 102 pharmaceutical lines.

The total CHAMPUS user beneficiaries number 5684.

The catchment areas population totals, per HSC Cir 11-2, 1988, are as follows:

Table 5

Catchment Area Populations

WRAMC	77,424	
DACH	83,621	
KACH	121,216	(MEDDAC)
Total	282,261	combined catchment areas population.

Data was retrieved during the month of January, 1990, at Kimbrough Army Community Hospital Pharmacy to determine the potential "ghost" population of persons over the age of 65, and therefore, CHAMPUS ineligible but Medicare eligible. This was done in response to concerns voiced by Colonel Cammarata, Army Pharmacy Consultant, Office of the Surgeon General on a visit to Kimbrough Army Community Hospital on 27 December 1989. The occasion was a briefing presented to the Army Surgeon General, Lieutenant General Ledford, by Major

David Kotzin, Chief Pharmacy, KACH. The presentation was an explanation of the "Buy Big, Buy Smart" Program innovations at Kimbrough and also the futuristic potential for mail service pharmacy. Colonel Cammarata was concerned about the unprojected demand in response to a mail service offer, in particular, the Medicare population. This question is fair and very realistic and could significantly affect the cost of a mail service pharmacy operation. The data retrieved during January 1990 revealed that in 1989 (1 January - 31 December), more than 2500 personnel, age 65 and over, had been serviced at the KACH pharmacy alone. While this amounts to only about two percent of the catchment area population, the aging veteran demographics will easily push that figure three to four times higher in the next decade. Add those percentages to the probability that most over-65 personnel make infrequent trips into the MTF but rely instead, now, on their Medicare compensation, and it is not unrealistic to assume that Colonel Cammarata is correct in his prognosis that a greater number of personnel may appear

from the hinterlands than are currently being serviced by the MTFs.

Perhaps at this point, it would be appropriate to address an issue which devolves from the Colonel's concern. Again, addressing demographics, and tying them to the current situation the military finds itself faced with the apparent end of a Cold War, the prospect presents itself that the MTFs, as with the rest of the Army, will probably have to do more with less. Troop cutbacks are sure to impact upon the Health Services Command just as much as upon the fighting forces, perhaps more so. These cutbacks, unfortunately, will come at a time when the retirement effects of the post-Vietnam All Volunteer Force are just beginning to be felt. In 1992, twenty years after the end of the draft, and at a time when the Army has a requirement to cut troops (as witnessed by a 1990 ODCSPER message encouraging earlier retirement and the attendant increase in Selective Early Retirement Boards), Army hospitals and pharmacies will be deluged by non-active duty personnel - personnel who under current directives

are eligible for health care.

It is with this deluge in mind, and also the probable increase in over-65 personnel seeking treatment in MTFs, that the Army must search for ways to handle the increased demand for services with fewer personnel -- and probably fewer dollars. If a Mail Service Pharmacy can save prescription dollars, increase efficiency and save badly needed personnel spaces, then it should, it must be implemented. A fear that such a system might serve to increase Army pharmacy usage is misplaced. So long as Health Services Command has the mission to provide for all our service members, past as well as present, we should not shirk our duty simply to save a dollar or two. Rather, we should look for ways to do that duty in the most professional manner possible.

To evaluate service efficiency a survey (Appendix A) was conducted at each of the MTFs with the objective of obtaining both subjective and objective data from eligible beneficiaries. Two hundred questionnaires were distributed at each MTF; KACH, DACH and WRAMC,

during the month of December 1989. Responses from KACH were 181 of the 200 surveys, a 90.5 return rate. Table 6 shows the tabulated results.

Table 6

Pharmacy Service Efficiency

	KACH	DACH	WRAMC
1. Travel time			
0-15 min	43%	11%	4%
> 15 "	34%	49%	9%
> 30 "	20%	34%	64%
> 60 "	3%	6%	23%
2. Travel miles			
0-20 miles	80%	72%	39%
20-40 "	16%	24%	43%
> 40 "	4%	4%	18%
3. Waiting time			
0-30 min	28%	4%	2%
30-60 "	42%	55%	70%
> 60 "	30%	41%	28%
4. # Prescrip/Mo.			
1	43%	37%	29%
2	21%	15%	20%
3	12%	14%	12%
4	8%	5%	12%
>4	16%	10%	27%
Note: 19% of DACH patients indicated <1 pres/month			
5. Use of other insurance			
CHAMPUS	12%	14%	5%
Other	7%	9%	16%
None	81%	77%	79%
6. Would use Mail Order			
Yes	61%	69%	67%
No	29%	26%	26%
Maybe	10%	5%	7%
7. Status			
Active duty	23%	5%	16%
AD Family member	37%	32%	8%
Retired Military	25%	37%	25%
RM Family member	15%	26%	50%

Time and distance traveled to KACH appear not to be an inconvenience as the majority of the sampled population traveled less than 30 minutes and live less than 20 miles from the MTF. Most (42%) considered the time waiting (30-60 minutes) for their prescription(s) a moderate inconvenience, and most (66%) just sat and waited or read while waiting. The majority were waiting for just one prescription (43%). The overwhelming majority (81%) never used any form of insurance to purchase pharmaceuticals outside the MTF. 61% said they would use a mail service pharmacy if the service were available. It appears that this population is a local catchment area population who use the MTF for their prescription needs. They are moderately dissatified with the waiting time, but having no other insurance, the only other alternative would be out-of-pocket expenditures. Most claimed they would use mail service for pharmaceuticals if turnaround time was acceptable, and for maintenance refill prescriptions.

Survey responses from DACH were 152 of the 200 surveys returned, a 76% response rate. Nonetheless,

the results were interesting. Again, Table 6 shows the tabulated results. Time and distance traveled to DACH appear not to be an inconvenience as the majority of the sampled population traveled less than 30 minutes (60%) and live less than 20 miles from the MTF (72%). Most considered the time waiting for their prescription(s) a moderate inconvenience (55%), and 41% considered their wait of greater than one hour a major inconvenience. Most people (58%) just sat and waited or read while waiting for their prescriptions, while 31% used the wait to shop at the PX or commissary. The majority (37%) were waiting for just one prescription. The large majority (77%) never use any form of insurance to purchase pharmaceuticals outside the MTF. If the service were available, 69% said they would use a mail service pharmacy, with 5% undecided. As with the sampled population at KACH, the patients at DACH are a local catchment area sample using the local MTF for their pharmaceutical needs. They are moderately or extremely dissatified with the wait, but with no additional insurance, use the MTF rather than pay out-of-pocket. Most said they would use a mail service

pharmacy for refills or maintenance drugs if the service was reliable.

Responses from WRAMC were less enthusiastic with 112 of the 200 surveys completed, a 56% return rate. Table 6 also shows the tabulated results. Time traveled to WRAMC appears to be a major inconvenience as the majority of the sampled population traveled between 30 minutes and 60 minutes (64%), with an additional 23% traveling greater than an hour's time to WRAMC. However, the majority lived within the 40 mile radius, 39% less than 20 miles, and 43% between 20 and 40 miles, with only 18% outside of 40 miles. The discrepancy between time and distance traveled probably has to do with the congested traffic patterns of the greater Washington, D.C. area. Most (70%) waited between 30 minutes and 60 minutes for their prescription(s), a moderate inconvenience, while 28% waited greater than an hour, a major inconvenience. 84% just sat and waited or read while waiting. The majority were waiting for just one prescription (29%), or two prescriptions (20%). As with the two MEDDACs, the overwhelming majority of sampled WRAMC patients

square feet, and houses a half-million items. The complex will be able to receive 2,000 items and ship 15,000 items per shift. (Appendix B) The system consists of four buildings, 110, 111, 10 and 11 (Appendix C). The system provides constant materiel control and contains all standard warehousing functions such as receiving, storage, rewarehousing, care and preservation, consolidation of orders, shipping and warehouse support functions under a single process control system.

The current personnel assigned to the depot will be retrained to operate the various types of IMC material handing equipment as well as the data terminal (CRT) process control equipment at the work station. The CRT monitor will display actions to be performed and guide operators through the work-related functions. The computer system is a network of Tandem central processors and intelligent microprocessor subsystems. The central processor provides rapid feedback of information enabling supervisors and workers to monitor performance and to quickly pinpoint problems. The IMC provides control of materiel at all stages in the

distribution process. Consequently, shipments can be received and immediately shipped if required. Integration of receiving, issuing, stowing, picking, consolidation, and packing enables functions to be performed simultaneously.

The IMC is vital to the future of the depot. Reduced budgets require doing more with less resources. At one time, bulky slow-moving items were handled at the DDMP. Now, with the IMC, the number of small fast-moving items received and shipped will increase. With this system already built, staffed, and funded, the location of a mail service pharmacy operating both in tandem, and in integration, with this complex, has great potential. The pharmacy depot sits across the street from the IMC. The commander of DLA, Colonel Shockey, referencing personal communication during an interview and tour of the IMC, on 12 December 1989, envisions the actual processing of prescriptions performed in a 30,000 square foot niche carved out of the depot storage area. The dislocation of 30,000 square footage of storage space would be easily integrated into the new IMC storage areas. This

processing area would be staffed with pharmacists, technicians, and administrative support personnel. Use of large Baker cells, bulk pharmaceutical purchasing ("Buy Big, Buy Smart") and the IMC distribution would comprise the framework of this model. An enclosed, connecting passageway between the pharmacy depot and the IMC could easily be built (Colonel Shockey, personal communication, 12 December 1989). This passageway would be part of the conveyor system moving the already prepared prescriptions into the receiving area of the IMC to begin the distribution process.

Building 110 is the receiving or induction terminal where items are received, inspected, packaged and preserved. As processed prescriptions enter the north end of building 110 on a tote-tray conveyor line, an initial sort is made and the prescription vials/bottles/containers are then placed into bar-coded tote trays. At the in-check station, inspection is performed and appropriate information is logged into the computer. This input builds tote routing and receiving files. The bar-coded totes are placed in modules on an automated guided vehicle (AGV) for

continued movement through the system.

Building 111 is a system containing 506,100 bin box locations and 41,952 openings for a total of 548,052 locations. It is a high-rise rack and bin storage facility. A crane picks up and deposits modules at the end of the operating aisle to and from the stands serviced by the AGV system. The system can move 15,500 line items from Building 111 to the consolidation work area in Building 11 by way of modules transported by AGVs.

The IMC pallet storage facility in Building 10 consists of two storage sections. The storage facility consists of 26 aisles in 17 bays with four rack tiers in each bay. An AGV delivers a pallet from receiving induction to the proper AGV interface stand in front of the aisle where the pallet/module is to be stored in the computer-assigned aisle, tier and location. Stowing and issue procedures are identical to procedures performed in the high-rise Building 111. Both Building 111 and Building 10 could be used for storage of bulk purchased pharmaceuticals and then retrieved when needed.

The pharmaceutical items, moved from the prescription processing facility to the induction area in Building 110, would bypass Buildings 111 and 10 and proceed on to the consolidation, packing and shipping area in Building 11. The bar-coded pharmaceutical items could be routed by AGVs to a work station in 11. A bar-code terminal and laser scanner for reading the tote bar code labels are at each work station.

The first step is consolidation of the items. The operator, using a hand-held scanner, scans the bar-code label that was placed on the item during processing and sends it to one of the packing stations.

The second station is packing. The items are conveyed into the packing area via four conveyors coming from the consolidation area with each conveyor feeding a separate bank of packing stations. Each work station has a conveyor feed line and shares a take-away conveyor line with the station next to it. The take-away line is used to convey the items into the shipping area, as well as to route empty totes back to the consolidation stations. A laser scanner automatically reads the tote number just prior to its

reaching the packing station at the end of the inbound lane. The system uses the data obtained as a result of the read of the tote bar-code label as it moves through the tote scan device. This device is mounted in the tote line-up area of the pack station to print the issue release/receipt document (IRRD). The packer places the item(s) in the appropriate package and the IRRD is placed both inside and outside of the package. The packer releases the sealed package and it is conveyed through a DWASP weigh and offer station to shipping.

Shipping is the last station. The IMC shipping station has a series of 24 work stations consisting of 14 small parcel, seven freight, two pallet pack stations and one pallet offer station. All stations, except the two pallet pack stations, are under system control. Each station has a CRT and a laser scanner. The small parcel work stations each have one master shipping label (MSL) printer; the freight work stations each have one MSL and one automatic packing list/route slip (APL) printer. Two inbound conveyors from the packing area deliver totes to be weighed, costed, mode

determined, and sorted for labeling and shipping. The container weight is automatically obtained. After system control has determined the mode and work station, a notification is sent to the automated weight and offer system process to cause the diversion to the proper work station. At the same time, system control sends MSL and APL data to the assigned work station.

By the time the tote arrives at the station, the shipping label and packing list/route slip will have already been printed. The station operator only has to apply the label and pack list/route list (freight only) to complete the shipment. If the mode is United States Postal Service (USPS), a conveyor transports the cartons to a USPS shipping area operated by postal employees where special labeling and manifesting are done. If the mode is United Parcel Service (UPS) or Roadway Packaging System (RPS), two take-away conveyors move cartons directly to one of four stations which route cartons directly to the shipping dock. The shipping dock is serviced by two extendable conveyors for direct truck loading.

Small packages such as pharmaceutical parcels can

be sent USPS, first class, as bulk mail for as little as $10.00 per 100 pounds (McLean, Robert B., Colonel, personal communication, 13 November 1989). Using the IMC as the processing, distributing, packing and shipping facility would change the way the military medical department does business, specifically the mailing of pharmaceuticals. The DDMP's modern mechanized warehousing facility is designed to increase workload and achieve a payback through substantial savings. It could also be a potential site for a Tri-Service mail order pharmacy system.

The concept of model B is to use the pharmacy depot at the DDMP as the Tri-Service site for processing mail service prescriptions and use the IMC for distribution. Assuming the availability of at least 30,000 square footage in the pharmacy depot, as communicated by COL Shockey, the number of pharmacy personnel to staff such an endeavor will be calculated. The objective is to determine if personnel spaces and ultimately dollars could be saved.

Ingredient costs (compared to those used in model A) will remain the same because the military

procurement system will continued to be utilized to purchase pharmaceuticals. However, the "Buy Big, Buy Smart" concept of bulk pharmaceutical purchasing could certainly save additional dollars. For instance, Table 7 provides an "approximate" cost savings of pharmaceuticals presently available in bulk. Last year, these pharmaceuticals were purchased in major lots of small quantities. Had they been purchased in the readily available bulk lots, cited savings would have accrued. Figures are derived by applying KACH's experience in savings, using bulk pharmaceutical purchasing, to WRAMC's "Top 50" listing (November 1988-November 1989) (Appendix D.)

Table 7

Bulk Purchase Savings

Product		Savings
CARDIZEM	60 mg.	$61,132.30
CALAN SR	240 mg.	29,324.66
VASOTEC	5 mg.	26,321.81
VASOTEC	10 mg.	11,329.32
CAPOTEN	25 mg.	15,605.72
PEPCID	20 mg.	10,627.30
		$154,341.11

Pharmaceutical manufacturers for sixteen drugs of WRAMC's "Top 50" list are presently discussing the feasibility of providing their products in bulk containers. Several companies have already completed accelerated stability testing and submitted their data tc the FDA for approval. If an average of 11.6% savings (based on KACH's current savings with "Buy Big, Buy Smart") is applied to WRAMC's "Top 50" list purchases of $2,723,237 for these 16 drugs, an approximate savings of $315,895 could be realized

(Kotzin, 1989).

If the principles of "Buy Big, Buy Smart" were applied to WRAMC's "Top 50" list for which discussions with manufacturers should soon be held, an approximate savings of $586,386 ($5,059,164 x 11.6%) could be realized. In May, 1989, KACH converted its Cholestryramine Powder (Questran) from boxes of 60 packets to cans of 42 doses (See Table 8). Based upon this, KACH projects a yearly savings of $24,360 or 3.5 days worth of pharmaceutical purchases.

Table 8

Questran Conversion

Presently Questran (Packets of 60's)	6505-00-105-0372	$36.55 (60.9 cents/dose)
Questran Can, (378 grams: 42 doses)	6505-01-274-2720	$11.40 (27.1 cents/dose)

From WRAMC "Top 50" (November 1988- November 1989) 532,260 doses were dispensed. At a savings of 33.8 cents/dose, a cost savings of $179,903 could have been realized. It is the opinion of the innovator of "Buy

Big, Buy Smart", Major David Kotzin, that the application of this concept could save WRAMC $2,000,000 (Kotzin, 29 November 1989).

The approximate cost savings of "Buy Big, Buy Smart" at KACH is as follows:

Table 9

"Buy Big, Buy Smart" Savings

PRODUCTS	QUANTITY	(6 mos)	SAVINGS (12 months)
CALAN SR	240 mg.	170,000	$23,042 (11.6%)
CARDIZEM	60 mg.	190,000	19,200 (16.6%)
VASOTEC	5 mg.	100,000	13,410 (11.6%)
VASOTEC	10 mg.	100,000	14,972 (11.6%)
PEPCID	20 mg.	80,000	19,017 (11.6%)
MOTRIN	600 mg.	240,000	4,500 (4.6%)
MOTRIN	800 mg.	240,000	4,500 (4.6%)
CAPOTEN	25 mg.	120,000	18,848 (11.4%)
			$110,489*

* This savings does not include additional savings in labor, warehousing charges, freight etc. (Kotzin, 29 November 1989).

To determine impact of mail service on combined military MTF operations, an actual civilian mail service pharmacy which produces 69,000 mail service prescriptions per week was chosen to help construct the model. The 69,000 figure is three times the present workload of the combined Washington, D.C. metropolitan area military treatment facilities; that is, KACH, DACH and WRAMC combined prescriptions are 23,000 per week (1200, 1200, 2200 respectively, per day) based on a five-day workweek. If the actual mail service pharmacy requires 77 registered pharmacists, 81 pharmacy technicians, and 124 clerical and typing staff, then, using its current workload, the military would require one-third that number to staff its facility. Therefore, there is a military requirement for 25 registered pharmacists, 27 pharmacy technicians and 41 clerical staff.

The percentage of dispensing costs by volume will be used to determine personnel spaces because it is a variable that changes with each of the models. KACH uses 48% by volume for ingredient costs of its top 100

refill drugs. Therefore, 48% of its current pharmacy staff equates to 3 registered pharmacists, 6 pharmacy technicians, and no clerical staff (there is only one clerk-typist space at KACH). DACH uses 52% by volume for ingredient costs of its top 100 refill drugs; 52% of its current pharmacy staff equates to six registered pharmacists, nine pharmacy technicians, and no clerical staff (again, DACH also has only one clerk-typist space). WRAMC's 82% volume would equate to 36 registered pharmacists, 37 pharmacy technicians, and one clerical staff. Therefore, the metropolitan district of Washington, D.C. (KACH, DACH, WRAMC) has a combined total of 45 registered pharmacists, 52 pharmacy technicians and one clerical staff spaces dedicated to dispensing refill prescriptions. A comparison of these spaces with the personnel spaces needed to service a centralized mail service facility in Mechanicsburg (25 pharmacists, 27 technicians, 41 clerical), reveals the following:

1. There appears to be an excess of "available" registered pharmacists presently dispensing refills at the three MTFs versus how many pharmacists

would be required to work at filling the same amount of refills at a central mail service pharmacy facility (45 at MTFs vs. 25 at centralized facility). This equates to 20 saved professional spaces, or a 45% savings in required professional personnel (20/45).

2. Of those pharmacy technicians required for the central facility, 48% would not be needed (52 at MTFs vs. 27 at centralized facility). Thus, 25 spaces, a 48% savings (25/52), could be realized in para-professional slots.

3. Clerical staff support is difficult to determine. The small number assigned to MTFs does not come close to the number needed to staff a centralized mail pharmacy facility (1 at MTFs vs. 41 at central). Approximately 20% of dispensing workload is clerical support. The non-professional staff requirement is 40 hires at minimum clerical wage and could be contracted out at low cost. At MTFs there exists no clerical support of the type required to support a centrally operated refill mail service prescription center. Thus, these low wage/low skill level personnel must be hired to fill a current vacuum. That is not to say

that a commensurate savings in support personnel spaces may not accrue to a facility which no longer requires a certain number of professionals and para-professionals. While the support personnel are evident at the contracted facilities analyzed, these same support personnel are hidden within the framework of the larger military organization. For example, much of the support required for administratively processing the refills at the contractor facility is accomplished at the MTF in other areas of the hospital. Records review is handled at central records, while much of the administrative overhead for the personnel is handled by supporting post administrative services. This area of support requirements will be addressed in greater detail later.

Savings in spaces is not the only benefit derived from this model, however. Costs savings can be realized as follows:

Using an actual civilian mail service pharmacy as a basis for comparison (a 30,000 square foot facility producing 69,000 prescriptions per week or three times the 3 MTFs productivity (23,000 per week)), cost

figures can be approximated. If the total operating (dispensing) budget in the civilian facility is $1,178,395.06 per month, $14,140,740.72 a year, then a centralized facility would be one-third that amount or $392,405.55 a month, $4,708,866.60 a year. Total labor budget is 60% of the total operating (dispensing) budget, or $707,037.03 per month, $8,484,444.36 per year (exclusive of labor involved in ingredient costs). If 70% of the total labor budget is for direct dispensing labor (pharmacists, technicians, clerical support), then to dispense 69,000 prescriptions each week for a year requires $5,939,111.05. One-third of that, to deliver 23,000 prescriptions per week, would be $1,979,703.68.

If one approximates registered military pharmacists' salaries (Lieutenants to Colonels) at $40,000 per annum, then $40,000 x 25 required central facility spaces is an expense of $1,000,000. The military pharmacy technicians salaries average at $18,000 per annum, so $18,000 x 27 required central facility spaces is an expense of $486,000; the clerical contracted staff at minimum wage would

accumulate at a cost of $383,760 per annum (41 spaces x $9,360). Total central facility dispensing costs to operate model B, with military personnel and hired low wage clerical support would be $1,869,760.

Mail costs are the second ingredient in determining the overall dispensing costs of the mail service system, and have the potential to raise the price to an unacceptable level. Past experience, however, indicates that a computerized variety of shipping means tied in with multiple contracts can lower mailing costs to as low as five cents per prescription. (This assumes a single prescription at approximately 1/2 pound.) At 23,000 prescriptions per week, that comes out to a total cost of less than $60,000 per year ($59,800).

Dispensing costs in this model as well as Model D (central facility, management contract) involve only labor costs and mailing costs, as the price of equipment such as "Baker cells" and computers must be a requirement to improve pharmacy efficiency, no matter which model is chosen. Such purchases would be a constant for all models, and therefore not calculated.

Both this model (B) and Model D at the Defense Depot in Mechanicsburg, Pennsylvania would also require conversion/start-up costs to renovate the existing facility at the pharmacy depot. But the cost must be considered a one-time sunk cost and not be a major factor in the consideration. Looking at just the three MTF pharmacies, one can advance a credible argument that a consolidated pharmacy will undoubtedly save much more than its construction costs. Waiting room areas will decrease; in fact, overall pharmacy sizes should decrease, so reconstruction/area upgrade costs will diminish in proportion to the area saved by a consolidated facility. Maintenance costs will shrink as well, while hospitals constrained by space problems, especially administrative space problems, may find the smaller size of pharmacy areas to be quite acceptable.

The Integrated Materiels Complex will also bear the brunt of the consolidated pharmacy cost and thus cause little impact on Health Service Command. In essense, since the IMC is searching for areas to expand its mission, it sees a national or regional pharmacy distribution point as an advantage, rather than

detriment, to its operations. Year to year maintenance costs would, for the most part, fall to the normal upkeep and maintenance budget of the IMC, and should also not be a determining point. The IMC would absorb the internal distribution and packing cost of the prescriptions, an already sunk cost for DDMP. Wastage would be better controlled at the central facility as usage would be accelerated and expirations and breakage less costly utilizing larger bulk purchased pharmaceuticals. As earlier stated, "Buy Big, Buy Smart" should be a definite incorporated operational procedure and "part and parcel" of the overall cost savings.

Results of Model C

This model compares two relatively similar medical activities with each other, an Army Community Hospital and a similarly sized Veterans Administration Hospital, to determine if a decentralized model would be a cost-effective option. KACH dispenses approximately 1200-1400 out-patient prescriptions per day or approximately 6,500 prescriptions per week. The actual

VA in the model, likewise, dispenses 363,212 per year or 6,984 prescriptions per week. Kimbrough currently dispenses 54% of its ingredient costs in refills (for a total of approximately 3510/week), while the VA dispenses approximately 62% in refills (or approximately 4330/week). Kimbrough's total pharmacy operating budget (FY 89) is $2,248,099.94, while the VA's budget (FY 89) is $2,816,959.50. By volume, 48% of KACH's out-patient workload is for dispensement of refill medications and all are potential mail service prescriptions. Mail service prescriptions make up 45% of the VA's out-patient workload.

The full time equivalent (FTE) staffing at KACH is seven registered pharmacists, 13 pharmacy technicians and one clerical support, while the VA staffs seven registered pharmacists, eight pharmacy technicians, and two clerical support staff full time. It appears that the VA facility can process an increased (15%) pharmacy workload without difficulty, or a significantly larger budget. (This is measured by the 550 more refill prescriptions per week processed by the VA (4330) than even the highest KACH weeks of 3780. 550/3780 = .15)

It is assumed that a certain percentage of the present CHAMPUS population will move into a mail service pharmacy population and therefore increase the workload. If the VA can handle a 15% increase in workload, then a commensurate 15% increase in the MTF's workload should be manageable using this model without an increase in expenses. Additionally, the KACH MTF has a 62% greater number of technical personnel assigned to handle approximately the same work load. Even if greater numbers of CHAMPUS users should switch to the decentralized MTF mail service system, the MTF should be able to handle the influx with little change in operating patterns.

The VA model spends approximately $145,539.16 on mail costs and has sunk $5200 into equipment such as CRTs and printers for operation of their business. (It is important at this point to recognize why the mail cost for the VA model is so much more than for the model B mail costs. Under model B, mail and shipping costs were computer regulated across a wide array of transportation means by a distribution system already in place. It becomes obvious to the casual observer,

that should this type system not be in place, as it cannot be in a decentralized system, then mail costs increase commensurately.)

If .54/.62 is .87, or the difference in costs to KACH is 87%, then 87% of the mail costs would be $126,619.07. This figure is the disparity between current refill costs by mail versus the difference in pharmacy technician manpower spaces. If there exists a difference of 5 pharmacy technician spaces between the MTF and the VA (13 at MTF vs. 8 at VA), then 5 slots at an approximate average salary of $18,000 per year equates to $90,000 saved in para-professional slots. This $90,000 offsets the cost of $126,290 for a difference of $36,290, an expense to the MTF to use the VA model to operate a mail service pharmacy as a decentralized model. To anticipate the increased workload that might be realized from a shift in CHAMPUS users, however, the model C savings in manpower costs might have to be reviewed, especially as more people are informed about the good aspects of the Mail Service Pharmacy System.

Results Model D

Model D is the civilian management-contracted model. This implies that the ingredient cost will remain the same as the other models. The government procurement system of pharmaceutical purchase is utilized in this model. Therefore, only dispensing costs are considered for possible cost savings. This model is based on an actual civilian mail service pharmacy, the same as the civilian company addressed in Model B. However, due to confidential nature of this information, the firm will not be named in this research paper.

The mail service pharmacy model as a management-contracted model would be located at the site of the pharmacy depot and the Integrated Material Complex at the DDMP (as was Model B). The only difference would be that the staffing and administration of the operation is civilian-contracted, and not directly managed by military Pharmacy personnel. However, the military would be directly involved in contract specifications and intermittent monitoring as desired. This particular civilian

pharmacy produces 274,155 prescriptions per month or 69,000 prescriptions per week. This number is approximately three times the current model's productivity level. Keeping this fact in mind, the cost figures will be appropriately scaled to the military workload needs.

Labor needs of the civilian model are divided into direct and indirect counts and costs. There exists a requirement for 77 registered pharmacists, 81 junior pharmacists or technicians, 60 typists, and 64 clerical staff. This totals 281 personnel for direct labor. The indirect labor staff consists of 7 administrators, 28 customer service personnel, 15 warehousers/inventory controllers, 7 maintenance personnel, 3 security personnel, and 13 clerical, a total of 71. Additionally, there are 16 managers/supervisors. The total labor staff numbers 368 headcount. The total cost of this labor is $707,037.03 per month or $8,484,444.36 per year. That translates to $235,679.01 per month or $2,828,148.10 per year as labor cost for a management-contracted operation to produce the current model's output of prescriptions.

Dispensing costs other than labor includes occupancy costs which are rent, depreciation, rentals, maintenance, repairs, telephone, utilities, taxes, insurance and amortization of start-up. This figure is 10% of the total operating expense or $117,839.50 per month or $1,414,074.07 per year. This equates to $39,279.83 per month or $471,358.02 per year to pay for the above in this model.

Customer support includes postage, promotional material and packaging inserts which are 24% of the operating budget. This cost should still be lower than the calculated cost as the model uses the IMC for distribution, packaging and shipping. Regardless, conservatively figuring, the cost amounts to $3,393,777.77 per year. This is $1,131,259.26 per year for the model. Other expenses are 5% of the operating costs and equals $707,037.04 per year, or $235,679.01 for the model.

The grand total in dispensing cost of this model per year, the sum of $2,828,148.10 and $471,358.02 and $1,131,259.26 and $235,679.01 is $4,666,444.39.

Functional responsibilities of the registered

pharmacists include checking and control of prescriptions, managing the main operation and supervising the narcotic cage, utilization review, doctor call, screening, and quality control. The technicians participate in doctor call, screening, "Baker cell", vertical and straight pick of medications to dispense a prescription. Data entry personnel perform the typing requirements and clerical staff open mail, prepare and place labels, and pack. The grand total cost of the above staff direct labor amounts to $1.651 per prescription and the indirect labor, $0.507 for a total of $2.158 per prescription in labor cost.

The mail service prescription drug work flow would move as described (appendix E). The patient mails the prescription to the mail service pharmacy at the DDMP pharmacy depot. The mail is opened and sorted. "Screening" includes the prescription checked by a pharmacist against plan specifications, generic substitution determination, national drug code number with unique check digit assigned, patient instructions and days supply checked, and drug information leaflet included. "Data entry" involves fuctions such as

eligibility verification on-line by name and identication number, quality control checks performed based on computerized patient profile, drug-to-medical condition check, drug-to-allergy check, premature refill evaluation, and on-line printing of labels and refill slips as well as coding of patient order. "Quality Control" comprises patient profile review on-line by registered pharmacist, and, if problem exists, prescription forwarded to professional services for research and resolution. "Professional services" handles premature refill evaluation, potential adverse reactions and abuse/misuse situations evaluation, and pharmacists contact physicians if necessary to determine resolution. If the problem is resolved, dispensing occurs, otherwise the patient must resolve the problem with his physician. The most frequently prescribed drugs are dispensed from automated "Baker cells" activated by coded patient order form, all other non-compounded drugs are dispensed from vertical carousels similarly activated. Drugs requiring special preparation are dispensed from the compounding area. Mail label is provided only after the computer verifies

completion of order. "Quality Assurance" functions includes final check performed by a registered pharmacist to ensure dispensing accuracy. Label is checked against prescription. Visual check of medication is performed and pharmacist seals package before sending it to the mailing area.

At this point in the process the prepared prescription is conveyed to the IMC for distribution, packaging and shipping, as described above in Model B.

IV. Discussion

Several assumptions are made when analyzing the data:

1. If a mail service system is accepted as a viable alternative to the current model, then all MTF out-patient refill prescriptions would move to the mail service system. No patient would be given the option of filling his prescription through a walk-in service. That is not to say, however, that pharmacies would not respond to emergency situations; as a matter of fact, because of the low number of personnel utilizing the MTF pharmacy itself, emergency refill prescriptions could be handled in an expeditious manner. Thus, the emergency could be treated like an emergency.

2. Beneficiaries currently use CHAMPUS because MTFs are inconvenient. Within the Washington, DC area the largest MTF is Walter Reed. With little or no parking available at WRAMC, the fight through Washington area traffic just to get to the pharmacy, an average wait of approximately one hour, and the subsequent drive home through the same traffic, the number of personnel authorized to utilize WRAMC who

decide to utilize CHAMPUS instead is great. While fewer inconveniences hamper visits to the other two MTFs, there is yet some drawback in the waiting time, and even some of these personnel have to drive as much as one hour each way to get to the pharmacy. Thus, despite the higher cost to the user connected with using CHAMPUS, these personnel spend the money rather than fight the problems associated with MTF pharmacy use.

3. Some CHAMPUS beneficiaries, based on cost savings (no co-payments) will move to MSP. In effect, we believe that the option to obtain commensurately convenient service at a much lower (or no) cost would draw a multiplicity of current CHAMPUS users into the MTF net. (Indeed, if assumption 1 is valid, then it might follow that all or the major portion of all normal refills would not be allowed under CHAMPUS.) Even if completely voluntary, however, many personnel would find mail order prescriptions a service superior to what CHAMPUS could offer. At lower costs and available in the convenience of ones own home, mail order prescriptions should attract a huge CHAMPUS

following.

4. Ingredient costs for all four models will remain essentially the same. No matter which option is chosen, if Buy Big, Buy Smart is adopted under the current MTF model, then the ingredient costs for all four models should remain essentially the same. Consequently, throughout this study, ingredient costs were not used as a factor to differentiate one model from another.

Analysis

Keeping these assumptions in mind, analysis of the set of models involves comparison of the costs of the baseline system against each mail service model's costs: that is, since ingredient costs are assumed equal, the dispensing costs.

Table 10

Sum of Analyzed Results

	SYSTEM COSTS (in Dollars)	PERSONNEL SAVINGS (in manpower spaces)
MODEL A	$1,648,190.34	0 Pharm; 0 Techs
MODEL B	$1,929,760.00*	20 Pharm; 25 Techs
MODEL C	$2,048,190.34	0 Pharm; 18 Techs
MODEL D	$3,519,473.20#	45 Pharm; 52 Techs

* Plus cost of clerical support

This assumes current management structure. See below.

Second, comparison must be made between the several models' service efficiency.

The first comparison is rather straight forward: all the responses are in finite numbers which we may compare easily, one against the other. Dispensing costs differential may be the key to decision making. A projection of the percentage of various estimated utilization rates will be done to determine costs under various user populations. If dispensing cost savings can be maximized, then the cost-effectiveness of the

particular mail service pharmacy model could also be maximized.

The second comparison is, however, not so easy. Essentially, in this comparison, we attempt to analyze different degrees of good and bad: two rather nebulous concepts over which we may have much disagreement. Nonetheless, such comparison is necessary if we are to reach a valid indication of which of the models meets our criteria of being not only most cost effective, but the best model for the soldier.

Comparison of Model B to Model A

Dispensing costs of the two models are fairly apparent. The summation of the dispensing costs of model A, as listed above, is the aggregate of the dispensing costs of the three MTFs. That is, DACH costs, which equal $218,474.55; KACH costs of $139,744.50; and WRAMC costs totaling $1,289,971.29. This makes the combined costs of the three MTF dispensing costs, per year, $1,648,190.34.

Determining the dispensing of costs of model B was a bit more difficult (there being no actual model in place, and thus no concrete budgets from which to

extract data.) As discussed above, however, the major costs associated with this second model, which differentiated it from the current model, were the labor and mailing costs. (See discussion of model B for renovation and upkeep costs.)

Labor costs could be calculated in two different methods: both gave similar outcomes. Extrapolating data from a comparable civilian operation determined that labor costs would equal approximately $1,980,000. Using approximate figures for a mix of military and low scale civilian hire netted a total of $1,870,000, or approximately 5% less. Both these figures are best guestimates, but are close enough to reinforce the idea that running model B, even including the mail costs of $60,000, would cost approximately $2,000,000 per year, or, at first glance, about $350,000 per year more than the current model.

This large $350,000 increase fails to take several items into consideration, however. Built into the B model are the dollars savings from having to use 20 fewer pharmacists and 25 fewer technicians, but having, eventually, to hire up to 40 new clerks. Not built

into consideration during model construct, however, is the number of "spaces" the military saves by being able to do the same or better job with fewer people. At a time when the Army is looking to cut spaces in the combat service support arena so it will not have to delete those allocations from its combat units, a manpower savings of 45 slots from the three Washington, D.C. units saves a combat platoon somewhere else.

Comparison of Model C to Model A

Turning all the MTFs into essentially decentralized mail order facilities has several good points, especially where the cost factor is considered, but does nothing for the major workload of the individual MTF as a whole.

A look at the general cost of the C model recognizes that mail costs are really the only increase over the current model A. These costs, approximately $120,000 for an MTF the size of KACH, (again, there is little mail cost savings under the decentralized model), are partially offset by the increased number of patients which the refill system can handle during any time period, simply because the system has the

capability of operating the complete 24 hours a day.

Assessing the composite mail costs for all three facilities, however, generates a figure almost as high as that of model B, even with its clerical support contract. (Somewhere near $400,000). That total is also not relieved by a commensurate decrease in personnel, (only about 18 total), so the cost of personnel, as well as the number of spaces remains almost as high as under model A.

One good point for model C is, however, the availability of pharmacists with which the population can relate. Over time, and despite the fact that military pharmacists rotate every three to four years, patrons of the decentralized facilities will be able to interact with the same pharmacists they deal with when they first receive their prescriptions. This allows the forming of a good pharmacist/patient relationship which pharmacists insist is a must for good pharmacy operations.

Comparison of Model D to Model A

Model D initially seems to present a problem from the perspective of cost. At over $3.5 million, it is

more than double the amount required to operate Model A. Certain aspects of this model need to be clarified, however. As indicated above, this model assumes the transfer, lock, stock, and barrel of the contractor structure after which it was modeled. While it is not possible to be explicit in projections, it is reasonable to assume that certain personnel positions required currently by the contractor would not be needed under Model D. For instance, customer service personnel are part of the current payroll, as are warehousemen (whose role would be undertaken by depot personnel.) Maintenance and security personnel slots would also be eliminated as would many of the current clerical positions. A management staff which is geared to constantly finding customers could be scaled back, since its only customer would be the Tri-Services utilizing the mail order service. Thus, while the working figure for Model D is that of the currently constructed contractor, a more realistic assessment of what the government needs -- and would pay for, could probably cut that figure by one-third, leaving a figure of about $2.3 million instead of 3.5.

By far, however, the biggest savings from choosing Model D would be in the realm of manpower spaces. As Table 10 shows, this model has a composite savings in manpower of at least 97 personnel. What the table cannot show, and indeed what cannot be necessarily uncovered, is the number of additional spaces saved by a cutback in military personnel. Some estimates indicate that within the General Service civilian corps alone, there are 5 civilians to support every single soldier. While that figure is higher for the Navy, and much lower for the Air Force, a commensurate decline in required GS positions must be anticipated with each military slot saved. As the slot savings rise, then, a hidden savings accrues to the military. Were this type model expanded to include every military pharmacy, the attendant personnel savings (and therefore dollars savings) would grow to a phenomenal level.

Comparison of Alternative Models

It becomes obvious to the casual observer that the competing models to choose from are B and D. Model A, while ostensibly the lowest costing model, in reality costs the Army what at this point in time it cannot

afford to pay -- manpower spaces.

Model B seems to be a compromise between the higher cost Model D with its huge manpower savings, and Model A with its low dollar cost, high personnel costs. In reality, however, choosing Model B would be taking only half measures. The beauty of Model D is the ability of the contracting office to mold the contracted support to the catchment area it serves. Should the decision-makers decide to go all the way and build a complete system of contracted pharmacy support, then two to three large mail order pharmacies could service the entire country. The savings in manpower would, in such an instance, be also reflected in cost savings, quite akin to the Buy Big, Buy Smart program. In essense, the program would be one of mail big, mail smart.

Earlier, this paper focused on the fairly high number of personnel who, during interviews, indicated they would like to try a mail order system. Their desire to try something untried, untested relates to their current dissatisfaction with the system. Sitting in waiting rooms full of "sick people" is not someone's

idea of how to spend ones time - especially when one also is sick. Refill maintenance is a process which should be as painless as possible. In trying to service our population, we constantly attempt to do what is best for the patient. In the case of mail order versus in house pharmacy, the patient is best served through a system of mail order refills. The type of organization which can do that kind of business best, is an organization for which refilling prescriptions is their business - their only business.

V. Conclusions and Recommendations

After having compared the various models to each other, a rational choice seems fairly evident. The methodology for determining that choice, however, shall be applied as follows:

1. If there are increased cost savings but decreased service efficiency, reject the model.

2. If there are increased cost savings and increased service efficiency, accept the model.

3. If there are increased cost savings and the same service efficiency, accept the model.

4. If there are the same cost savings and increased service efficiency, accept the model.

5. If there are some increased costs, but countervailing increased service efficiency and other unquantifiable advantages, consider accepting the model.

The comparison models have shown a combination of savings or losses in costs and services compared to the baseline prescription model. From the very beginning, we asked ourselves how best to judge our outcome. As a rather rigid set of parameters we said initially, "If a

significant difference does exist, with mail service showing a cost/benefit savings, then HSC should make a decision to fund a pilot study to gather additional data. If it is shown that the baseline model is less expensive than a mail service delivery system, while providing equal or better service, then the decision to pursue mail service is no longer valid."

The only problem which confounded us was when cost and service under one model diverged greatly with the baseline. If costs were greater while improving service, or savings greater while degrading service, a decision must be made whether to save the government money or to assist the soldier with a service.

Looking at our four models, and comparing each to the baseline and then to each other, it became obvious that some form of mail service pharmacy would be the appropriate choice. Model B offered a valid solution in which the military provided the mail order service at a cost lower than a civilian contracted facility, but at a cost substantially higher than under the current system - if one does not look too closely for certain hidden costs and inadequacies of the current

system.

Model C was essentially the current model with access to a mailbox. Nonetheless, this model was the least expensive of the newer models, for essentially, there were no incurred start up costs, nor disruptions in service to provide customers with increased headaches. Under this system, the beneficiaries could be most gradually assumed into a new system and thus weaned as painlessly as possible from their dependence on the common walk-in pharmacy. Model C allowed the customer the luxury of continuing to deal with the same pharmacist, rather than having to deal at a distance with an unembodied voice from over the phone. The major drawback with the C Model was that it saved the government very few spaces. Even when it was postulated that decentralized, but mail service pharmacies could give up some of their spaces, (simply because the flexibility of multishift pharmacies provided more time to deal with a workload which could equitably be shifted across workshifts) the space savings were not high enough to justify this move. With attendant possibilities of post closings (and

therefore pharmacy closings) certain segments of the population the MTFs now serve would lose their access to pharmacies. There had to be a better way.

Model D proved to be that better way. By contracting the pharmacy operation to a permanent mail service organization, the Army would save the equivalent of a company-sized unit with the stroke of a pen; and with little trauma on both sides. The relative cost increase in operations will probably not be as great a differential as more cost savings in post operations become evident. Almost the entire cost of hiring the administrative help, approximately $350,000, will, in the long run, be recouped in lower costs of post support (the so-called hidden costs in running a military post.) Thus, the biggest drawback to choosing the contracted model will probably, after futher study, diminish. Even should the cost differential remain, however, as stated above, that which will be gained more than offsets such a price increase. Efficiency will increase as the agencies have shown a major capability in handling massive loads of pharmaceuticals - an inestimable attribute at a time when pharmacy

demands will be going ever higher. The patron will be serviced with greater ease to both himself and the MTF - no longer will the beneficiary be obliged to run to the MTF each time he requires a refill, and no longer will the Army hospital resemble a Dickensian work house as dozens of patients sit waiting for prescriptions which seemingly never come. Additionally, as stated above, for those few times when the patient must return to the MTF for pharmacy support, the pharmacy will not be closed to him because of long lines. In all, it becomes evident that model D would be the best alternative.

Assessing the above various options, therefore, and viewing the Army in the light of increasingly more constrained resources but higher demand, we are left with the obvious recommendation:

That the Army adopt option D; contracted mail order pharmacy services, operating out of integrated materiel centers and taking advantage of the buy big, buy smart programs. As a rapidly changing world demands that the total Army reconfigure to meet the challenges of the new decade and the new century, the

Army's medical elements must also plan to adapt to new parameters. Already, the testing of the Composite Health Care System proves the viability of automated and integrated patient administration, scheduling, labs, radiology, pharmacy and nursing. Innovative programs have decreased CHAMPUS costs by contracting doctors at lesser fees and have saved valuable manhours by having optical companies come to the troops to fit safety glasses rather than the other way around.

The program we have examined, the Mail Order Pharmacy Service, also shows potential for savings many times its cost. Properly constructed, tested and contracted, this initiative clearly will help move the Army medical program into the Twenty-First Century.

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APPENDIX A

PHARMACY SURVEY

I am a student in the US Army-Baylor University Graduate Program in Health Care Administration and am conducting research for my thesis. Please take a few minutes of your time to complete this questionnaire.

1. How long does it take you to travel to this medical treatment facility to obtain your out-patient prescription drugs?

2. How many miles would you estimate you travel to this facility to obtain your prescriptions?

3. On the average, how long do you usually wait to obtain your prescriptions?

4. How do you pass the time waiting for your prescriptions to be filled?

5. How many prescriptions per month do you have filled at this medical treatment facility?

6. Do you sometimes use CHAMPUS, Supplemental Care, or other third-party payers to obtain your prescription drugs? Which?

7. If the Army provided a mail-order pharmacy service (mail in your prescription to the Army pharmacy - they return it to you in the mail), would you take advantage of such a service?

8. What is the status of the individual requiring today's prescription? Check one: _____Active Duty or____Family Member
_____Retired or _____Family Member

9. Please feel free to provide any comments.

Thank you for your valuable input.

MARY L. GABBARD
CPT, AN
Administrative Resident

APPENDIX "B

FACT SHEET

INTEGRATED MATERIEL COMPLEX
DEFENSE LOGISTICS AGENCY
DEFENSE DEPOT MECHANICSBURG, PENNSYLVANIA

CONSTRUCTION:

Construction Manager:	H. B. Alexander & Son
Cost:	$14,500,000
Completed:	June 1987

EQUIPMENT:

Contracts Awarded	
Installation:	Beginning July 1987
Cost:	$24,500,000

COMPUTER:

Award Contract:	August 1987
Installation:	November 1987
Cost:	$2,700,000

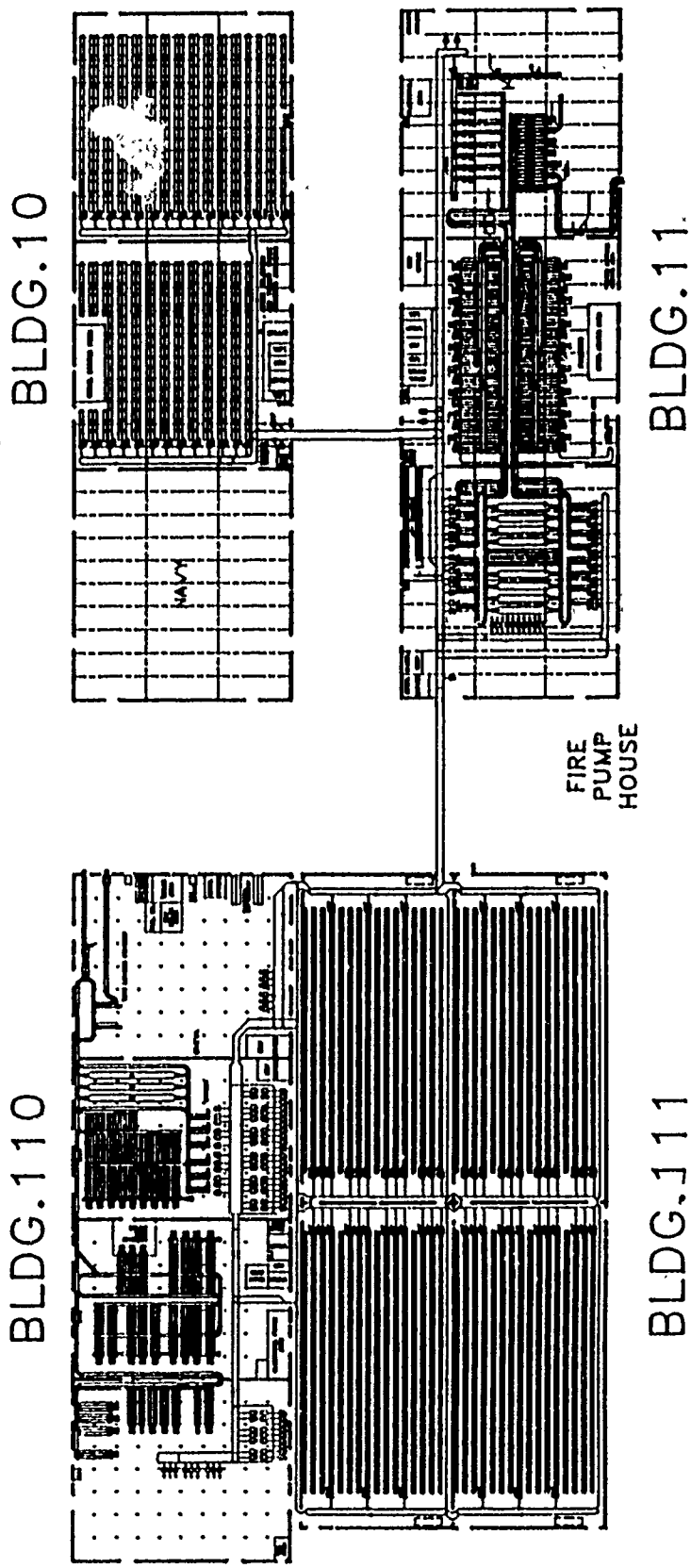
CAPACITY:

480,000 square feet
500,000 items stored
2,000 items received (one shift)
15,000 issued (one shift)

PURPOSE:

Increase productivity to enable DDM to meet expanding work load with current resources

APPENDIX C



No. 1
25/87

Available now

Serious discussic and/or letter of intent

[redacted]on-going discussior

(several more companies researching idea-on KACH TOP 50, not WRAMC's)

APPENDIX D

WALTER REED ARMY MEDICAL CENTER
TOP 50 MEDICATION LIST

NOV 89 RANK	MAY 89 RANK	NOV 88 RANK	MEDICATION NAME	UNIT	COST	QUANTITY	TOTAL COST
1	5	17	LOVASTATIN 20MG (MEVACOR) 60'S	BT	74.86	6838	511892.68
2	2	1	RANITIDINE 150MG (ZANTAC) 60'S	BT	34.16	14334	489649.44
3	1	2	ZIDOVUDINE (RETROVIR) 100'S	BT	150.24	3076	462438.72
4	3	3	DILTIAZEM 60MG (CARDIZEM) 100'S	BT	31.08	11849	368266.92
5	6	11	PROTROPIN GROWTH HORMONE	PG	375.58	897	336895.26
6	4	4	CHOLESTYRAMINE (QUESTRAN) 50'S	PG	36.55	8871	324235.05
7	8	5	ALBUMIN NORMAL HUMAN SERUM USP	CN	61.98	4957	307234.86
8	7	9	CYCLOSPORINE ORAL SOLN 100MG	PG	160.11	1855	297004.05
9	10	16	VERAPAMIL 240MG 60'S	BT	35.15	7192	252798.80
10	10	12	TERFENADINE 60MG (SELDANE) 100	BT	37.09	6613	245239.08
11	11	20	IMMUNE GLOBULIN INJECTION 6GM	PG	206.96	1154	238831.84
12	9	7	NAPROXEN 250MG (NAPROSYN) 500S	BT	161.62	1477	238712.74
13	18	21	ENALAPRIL 5MG (VASOTEC) 100'S	BT	53.86	4213	226912.18
14	12	8	ATENOLOL 50MG (TENORMIN) 100'S	BT	34.31	6146	210869.26
15	13	6	NIFEDIPINE 10MG (PROCARDIA) 100	BT	24.10	8101	195234.10
16	15	13	CHEMSTRIP 2G+50	BT	20.79	8398	174594.42
17	14	14	PIROXICAM 20MG (FELDENE) 500'S	BT	459.97	348	160069.56
18	0	0	ISOTRETINOIN 40MG (ACCUTANE)	BT	228.49	680	155373.20
19	21	29	ETOPOSIDE 100MG (VEPESID)	VI	81.03	1862	150867.86
20	26	24	PRIMAXIN 500MG INJECTION 10'S	PG	155.61	961	149541.21
21	20	22	CAPTOPRIL 25MG (CAPOTEN) 100'S	BT	30.79	4446	136892.34
22	19	19	SULINDAC 200MG (CLINORIL) 100S	BT	57.33	2139	123056.67
23	41	0	GEMFIBRIZOL 300MG (LOPID) 100S	BT	27.32	4346	118732.72
24	43	46	CIPROFLOXACIN 250MG (CIPRO) 50	BT	76.65	1502	115128.30
25	25	0	CEFAZOLIN 1GM (KEFZOL) 96'S	PG	567.74	201	114115.74
26	24	25	NAPROXEN 500MG (NAPROSYN) 500S	BT	221.73	508	112638.84
27	49	0	CEFTRIAXONE 1GM (ROCEPHIN) 10S	PG	251.30	430	108059.00
28	28	32	CROMOLYN INHALER (INTAL)	PG	36.73	2928	107545.44
29	23	23	SUCRALFATE 1GM (CARAFATE) 100S	BT	30.60	3513	107497.80
30	0	0	CLONIDINE 3MG PATCH (CATAPRES)	PG	37.68	2838	106935.84
31	35	45	TAMOXIFEN 10MG (NOLVADEX) 100S	BT	42.16	2346	98907.36
32	27	38	CISPLATIN 50MG (PLATINOL)	VI	77.29	1274	98467.46
33	30	33	CIMETIDINE 400MG (TAGAMET) 60S	BT	32.06	3069	98392.14
34	17	15	DOXORUBICIN 50MG (ADRIAMYCIN)	VI	138.18	709	97969.62
35	33	0	ENALAPRIL 10MG (VASOTEC) 100'S	BT	56.52	1728	97666.56
36	0	0	FAMOTIDINE 20MG (PEPCID) 30'S	BT	25.28	3624	91614.72
37	37	34	TIMOLOL 0.5% OPTH SOL	BT	9.85	9003	88679.55
38	36	0	ACYCLOVIR 200MG (ZOVIRAX) 100S	BT	57.19	1484	84869.96
39	0	0	CLONIDINE 2MG PATCH (CATAPRES)	PG	81.84	982	80366.88
40	0	0	CIPROFLOXACIN 500MG (CIPRO) 50	BT	82.13	952	78187.76
41	0	0	FLUTAMIDE 125MG (EULEXIN) 500S	BT	487.75	160	78040.00
42	0	0	IPRATROPIUM INHALER (ATROVENT)	EA	15.62	4969	77615.78
43	0	50	LEUPROLIDE (LEUPRON) DEPOT	PG	299.52	252	75479.04
44	32	31	BLEOMYCIN INJECTION 15 UNITS	VI	134.62	530	71348.60
45	40	35	MEZLOCILLIN 3GM (MEZLIN) 10'S	PG	64.06	1068	68416.08
46	31	26	CAPTOPRIL 50MG (CAPOTEN) 100'S	BT	51.33	1315	67498.95
47	39	37	GLIPIZIDE 5MG (GLUCOTROL) 500S	BT	79.16	848	67127.68
48	44	44	ATENOLOL 100MG (TENORMIN) 100S	BT	51.99	1278	66443.22
49	0	0	ALBUTEROL INHALER 17GM	EA	4.21	15736	66248.56
50	0	0	VANCOMYCIN 5GM	VI	49.00	1729	64837.50

APPENDIX E

MAIL SERVICE PRESCRIPTION DRUG WORK FLOW